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Food Security Monitoring and Early Warning Systems

International, regional and national examples, and Indonesia's application of best practices

(Dewan Ketahanan Pangan, Departemen Pertanian Rl and World Food Program (WFP), 2009)

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Contents

Preface i

Executive Summary ii

1. International, Regional and National FSMEWS 1

2. FSMEWS Best Practices and Indonesia's Experience 20

3. Conclusions and Recommendations 37

References 39

Appendix 1. AFSIS Agricultural Commodity Outlook No. 7 December 2011 Table of Contents A1

Appendix 2. Integrated Phase Classification Acute Food Insecurity and Chronic Food Insecurity Reference Tables A4

Appendix 3. Key Informants A10

List of Tables

Table 1 Food Security Portal indicators by source 2

Table 2 Information in selected GIEWS Country Briefs 5

Table 3 Key Products of Livelihood Profiling 22

Table 4 Integrated Food Security Phase Classification Response Objectives and Options 36

List of Figures

Figure 1 Livelihood Zone Map, Niger 12

Figure 2 Food, Income and Expenditure Cycles of the Poor and Seasonal Calendars, Niger Irrigated Rice Livelihood Zone 14

Figure 3 Livelihood Seasonal Monitoring Calendar for Niger's Niger River Irrigated Rice Livelihood Zone 15

Figure 4 Rice Production and Market Flow Map, Niger 16

Figure 5 IPC Map of Indonesia 2006 using IPC Version 1 Reference Table 17

Figure 6 Data Flow to and from MOA Center for Agricultural Data and Information Systems (PUSDATIN) 26

Figure 7 Wet Land Map of Pagerharjo Village (Scale 1:2500), 201 28

Figure 8 Comparing Current Data with Previous Time Periods 33

List of Exhibits

Exhibit 1 Food Security Portal Capacity Strengthening and Policy Analysis Tools 4

Exhibit 2 EWS NET Reporting Products 12

Exhibit 3 Niger's Niger River Irrigated Rice Livelihood Zone Profile 13

Exhibit 4 Examples of Early Warning Report Narrative 32

Preface

This paper surveys relevant international, regional and national food security monitoring and early warning systems (FSMEWS); summarizes globally accepted best practices in FSMEWS and describes to what extent current Indonesian food security information systems conform to them; and makes recommendations on next steps the Indonesian government might consider to strengthen food security monitoring and early warning capacity. The paper was requested by the Indonesian Ministry of Trade Center for Domestic Trade Policy. The activity was supported by the SEADI Project implemented by Nathan Associates, with field discussions conducted in Jakarta in June 2012. The author would like to thank Dr. Alla Asmara and Dr. Wayan Susila for their assistance in collecting and synthesizing information, and explaining the nuances of Indonesia's food economy and policies; and staff of the Ministry of Trade, Ministry of Agriculture, Indonesia Bureau of Statistics, World Bank and World Food Program for their time and the information and ideas shared. The author is Anne Swindale, Ph.D. She has more than 25 years of experience in project management, research, and provision of technical assistance in agriculture, food security, and nutrition strategy and program assessment, design, monitoring, and evaluation.

Executive Summary

This paper surveys relevant international, regional and national food security monitoring and early warning systems (FSMEWS); summarizes globally accepted best practices in FSMEWS and describes to what extent current Indonesian food security information systems conform to them; and makes recommendations on next steps the Indonesian government might consider to strengthen food security monitoring and early warning capacity.

International, Regional and National FSMEWS

After the food price crisis in 2007/2008, international and inter-governmental organizations recognized the importance of increased information availability and transparency to assist the international community to better monitor, analyze and predict behavior of key indicators related to global availability of and access to food. This paper summarizes and provides links to the information and tools available from five key FSMEWS, one regional FSMEWS and country-level approaches implemented by three major players in the area.

Based on the range and type of information available, its timeliness, and the analytic tools provided, **International Food Policy Research Institute (IFPRI's) Global Food Security Portal** and **Food and Agriculture Organization (FAO) Global Information and Early Warning Systems (GIEWS)** appear to provide the most useful and relevant information, particularly in terms of getting early warning of possible problems in the global food market and in countries on which Indonesia depends for key imports. **FAO's Rice Market Monitor** is another useful source of information for Indonesian policy makers. Nationally, the WFP-supported Cambodia FSMEWS is a good example of a national-level FSMEWS and the USAID's Famine Early Warning System Network (FEWS NET) country-level approaches reviewed represent many best practices. The three international sources are briefly described below.

IFPRI Global Food Security Portal [http://www.foodsecurityportal.org/]

The IFPRI **Food Security Portal** contains over 40 indicators related to food security, commodity prices, economics, and human well-being. IFPRI pulls together data from different sources, including its own data, checks for data quality and relevance, and provides a wealth of information and a set of interactive tools to assist food policy analysis and decision-making. This report contains a complete list of the information and tools available; two items the Ministry of Trade (MOT) may find particularly useful are the **Excessive Food Price Variability Early Warning System** to measure whether world markets are experiencing periods of increased price variability, and the **Agricultural Commodity Prices and Returns** section for up-to-date weekly global price data and daily returns on future price data for hard and soft wheat, maize, rice and soybeans. The portal provides a series of tools to help

strengthen the capacity of policy makers and institutions, including training curricula and tools for policy analysis.

FAO Global Information and Early Warning Systems (GIEWS) [http://www.fao.org/giews/]

GIEWS tracks production, consumption, stock and price data, and produces several very useful publications addressing availability (supply/demand) and access (price) current situation trends and forecasts globally, regionally and by country. Publications of particular interest to MOT include the monthly **Global Cereal Supply and Demand Brief** with an update on production, utilization, and stocks forecast for cereals, wheat, coarse grain and rice; the quarterly **Crop Prospects and Food Situation**, with a global cereal supply and demand overview and a detailed assessment of cereal production and supply and demand conditions by country and region; and the biannual **Food Outlook,** with in-depth world market analysis and forecasts for cereals and other major food commodities on a commodity by commodity basis. GIEWS also produces quite useful **Country Briefs** on the overall food security situation, events that affect production of key crops, trends in prices of key foods, and export and import trends and forecasts for Indonesia and countries that are the main sources for Indonesia's key food imports.

FAO Rice Market Monitor (RMM) [http://www.fao.org/economic/est/publications/rice-publications/rice-market-monitor-rmm/en/]

The RMM analyzes recent developments in the global rice market, tracks international rice export prices, estimates global paddy production for the previous year, and forecasts global paddy production, rice trade, rice utilization, and rice carryover for the current year, with an explanation on the basis for these forecasts.

FSMEWS Best Practices and Indonesia's Experience

Food security monitoring tracks food security conditions and trends at the national, sub-national, community and household level. Food security early warning adds a focus on risks and hazards and on unusual or anomalous patterns or behaviors and uses this information to forecast how food security conditions are likely to evolve in the short- and medium term, and make recommendations on how to respond. Forecasts and alerts must be issued with enough lead time (the "early" in early warning) for appropriate policy decisions and program actions to be taken.

Five key FSMEWS best practices are identified in this report:

1. Collaborate and communicate, promote stakeholder networks and establish "experts groups" and other forums where multi- and cross-disciplinary and multi- and cross-sector exchange can happen with public and private sector actors
2. Establish a thorough, baseline understanding of food security, livelihoods, vulnerabilities and markets
3. Collect, analyze and present accurate and timely data on a range of food security status and early warning indicators at an aggregated and disaggregated (sub-national) level, both quantitative and qualitative
4. Have analysts with in-depth knowledge analyze the data and present the minimum of information needed, concisely, with narrative and in context. Be clear on the level of confidence in the projections being made.

5. Link early warning to response, link information flows to decision making processes

Indonesia's experience

Indonesia does not currently have a FSMEWS per se. A high-level ministerial forum exists [Food Security Council (FSC)] where data and trends are discussed by government institutions and responses to potential food security issues determined. Data is provided by several institutions but the presentation format does not routinely include narrative that places the data in context or describes what may be some of the factors determining anomalous behavior. The Coordinating Ministry for Economic Affairs (Menko) does not appear to develop documentation to inform FSC discussions that consolidates the data from different sources, and analyzes it prior to each meeting. Participation by non-government agencies (e.g. private sector) at the FSC meetings is by invitation only on an as-needed basis.

A Food Security and Vulnerability Atlas of Indonesia was published in 2009 which has information on availability, access and utilization; describes where the greatest vulnerability to food insecurity is and how many people are estimated to be food insecure; and identifies the principal determinants and risks of insufficient or inadequate availability, access and utilization. The Atlas is a very important and useful document that supports targeting and appropriate program design. Provincial-level Food Security and Vulnerability Atlases have been published for Nusa Tenggara Barat and Nusa Tenggara Timur (NTT), and will be completed for Padua during 2012. NTT livelihood zones were identified and mapped in 2010. No other livelihood mapping appears to have been conducted for Indonesia.

A 2005 market flow study on rice, cooking oil, meat, among other commodities, exists, although it does not seem to be used much as a reference. MOT plans to update it in 2013, and to conduct a study of inter-regional trade in rice and sugar during 2012 with the USAID-funded SEADI project. World Food Program (WFP)'s Disaster Management and Logistics unit completed a very comprehensive logistics capacity assessment in Aceh last year and is conducting assessments in other WFP target provinces.

A lot of primary and secondary data on prices, agricultural production, trade, consumption and climatic conditions are collected and compiled through a number of different data tracking and analysis efforts implemented by different Indonesian government agencies. A number of data quality issues with production and consumption estimates have been documented. Information on stocks, especially of rice, is relatively weak. Models used for forecasting basically rely on extrapolation from time-series. There are a number of on-going efforts to address the data quality issues and strengthen models.

National and provincial-level health and nutrition information is collected every three years, and monthly data on the severe acute malnutrition case load and treatment outcomes are reported by health centers into a Directorate of Nutrition database.

WFP periodically publishes a Monthly Price and Food Security Update that presents data on prices, rainfall, crop production and wages, all derived from secondary data sources and most national-level (except for rainfall maps from the Meteorological, Climatological and Geophysical Agency). It describes trends at the national level and does not present information for specific vulnerable areas or important markets, and contains minimal discussion or analysis of whether the data indicate increased risk for availability of or access to food.

Indonesia has a number of response options to react to early warning of potential food insecurity problems. Recommendations on which option to pursue are discussed in the FSC following presentation of data and reports, and the final decision lies with the Coordinating Minister.

Conclusions and Recommendations

Indonesian institutions collect a wide range of food-security related data. However, the country has a long way to go to convert the data into a functioning FSMEWS, if in fact that is what is needed. Some of the issues that would need to be addressed are structural in nature, and others have to do with the relative importance of early warning of acute food insecurity as opposed to quality monitoring and in-depth understanding of chronic food insecurity.

Fundamentally, Indonesia does not seem to have established the foundation on which coordinated, integrated, multi-sectoral food security and nutrition strategy, policy and programming should be developed and implemented. There appears to be a clear gap in terms of national and provincial technical food security coordination bodies that could support the design and implementation of food security and nutrition programs, and the generation and interpretation of food security information. Trying to establish a functioning and effective FSMEWS in the absence of a strong foundation and government-expressed demand would be difficult, and probably of questionable utility, given the chronic nature of food insecurity in Indonesia and the infrequency of acute food insecurity crises.

Nonetheless, much can be done to improve the quality and effectiveness of food security information generation, analysis and use. The key informants were almost unanimous in their opinions, and the author largely agrees, that **better quality data - more timely and more accurate - and more accurate models** are required, rather than more or different data. There are several on-going efforts to address some of the data quality and modeling concerns.

In addition to these on-going efforts, addition steps that could be considered include:

1. **Add indicators to MOT Market Price Monitoring system**: The MOT could usefully **integrate the price, production and trade tracking, forecasting and analytical data and tools now available through initiatives such as IFPRI's Food Security Portal and FAO GIEWS** into their Market Price Monitoring system to supplement existing information and deepen their knowledge of current events that could affect Indonesia's main food import commodities in international markets and in countries that are the main sources of and competitors for these commodities. Close **collaboration with Ministry of Agriculture (MOA) Agricultural Marketing Information System (AMIS) focal points** as the AMIS initiative moves forward is also important.1

2. **Strengthen analytical and report-writing capacity**: Support for better use of existing data should be a priority. Capacity strengthening of ministry analysts in how to **analyze and combine quantitative and qualitative current and historical information**, and **write effective, action-oriented food security briefs** and bulletins could be a useful immediate next step. Capacity-strengthening workshops in this area should be designed to include participants from the range of agencies currently involved in collecting, analyzing

[1] AMIS is a G20 initiative, initiated in response to the global food price crisis in 2007/2008, which aims to enhance the efficiency of global food markets by increasing transparency and information availability and strengthening collaboration and dialogue among main producing, exporting and importing countries, commercial enterprises and international organizations. It is still in the process of development.

and reporting food security-related information, including the Central Bureau for Statistics, Menko, MOA, MOT and WFP.

3. **Strengthen baseline data and understanding**: The government could strengthen its understanding of why and how people are food insecure in a number of areas, to better monitor factors that can potentially affect the food security situation.

    a. Given the effects of government policies that keep food prices high, continued efforts to **quantify and explain the effect of government trade and price policy on poverty and household food security** would be useful to inform policy.

    b. Indonesia's food marketing system already faces numerous logistic challenges, some due to inadequately developed infrastructure, and other due to natural hazards. A **comprehensive production and commodity market networks analysis** would strengthen the government's ability to understanding and predict which areas and population groups are likely to be affected by different kinds of production, market and natural risks.

    c. Improving understanding the ways in which people access food (sources of food - own production, purchase, safety nets, etc. – and income – crop and livestock sales, labor, trade, etc.) and how these variables vary according to a household's geographic location and wealth will improve the government's capacity to identify and monitor the hazards that can threaten this access. The government should consider conducting a **livelihood profiling exercise** for the other highly vulnerable areas in Indonesia, to complement the livelihood zones already identified in NTT.

4. **Expand software capacity**: The MOT should consider building capacity to use CS Pro, a US Census Bureau-developed public domain statistical package for entering, editing, tabulating, mapping, and disseminating census and survey data, and identifying anomalies in price patterns at national or regional levels. The package is widely used by statistical agencies in developing countries. The U.S. government provides free training in using the software.

1. International, Regional and National FSMEWS

This paper does not cover every FSMEWS that exists – they are too numerous and not all particularly relevant to Indonesia. The paper focuses on international and regional FSMEWS that the Indonesian government might tap into for useful food security information, particularly in terms of getting early warning of possible problems in the global food market and in countries on which they depend for key imports. It also covers approaches and useful examples of national FSMEWS, implemented by three major players in the area: the USAID-funded Famine Early Warning System Network (FEWS NET), the Integrated Food Security Phase Classification (IPC) system, and the World Food Program (WFP). While the majority of countries FEWS NET covers have food economies, and face food insecurity conditions and determinants that are often quite different from Indonesia's, the approaches FEWS NET uses do represent many best practices, so it is useful to include.

The international FSMEWS covered include:

1. International Food Policy Research Institute (IFPRI) Global Food Security Portal
2. Food and Agriculture Organization (FAO) Global Information and Early Warning Systems (GIEWS)
3. FAO World Food Situation
4. Agricultural Market Information System (AMIS)
5. U.S. Department of Agriculture (USDA)'s Economic Research Service (ERS)'s Global Food Security Briefing Room

The regional FSMEWS covered is:

1. Association of Southeast Asian Nations (ASEAN) Asian Food Security Information System (AFSIS)

The country-level FSMEWS covered include:

1. USAID's Famine Early Warning Network (FEWS NET)
2. Integrated Food Security Phase Classification (IPC)
3. WFP Cambodia

1.1. International FSMEWS

The first two FSMEWS covered in this section, IFPRI's Global Food Security Portal and FAO's GIEWS, provide the most useful and relevant information that the Indonesian government in general, and the Ministry of Trade (MOT) in particular, could use to supplement existing information and deepen their knowledge of current events that could

affect Indonesia's main food import commodities in international markets and in countries that are the main sources of and competitors for these commodities. FAO's Rice Market Monitor (section 1.1.3.) is another useful source of information for Indonesian policy makers.

1.1.1. IFPRI Global Food Security Portal [http://www.foodsecurityportal.org/]

Most of the global FSMEWS described in this paper provide information on production, prices, utilization, trade and stocks of major food commodities. One challenge for a food security analyst is consolidating information from the different sources, seeing whether the data are telling the same story, and making sense of what is being told when different indicators or different sources seem to be telling different stories. The IFPRI **Food Security Portal** contains over 40 indicators related to food security, commodity prices, economics, and human well-being. All the data appear to be up-to-date. IFPRI pulls together data from different sources, including its own data, checks for data quality and relevance, and provides a wealth of information and a set of interactive tools to assist food policy analysis and decision-making. The sources of data and the indicators drawn from them are listed in Table 1. Data from the site can be downloaded from the country profile section of the website and through the Data API[2].

Table 1

Food Security Portal indicators by source

Source	Indicators
GIEWS	• Monthly commodity prices (retail and wholesale)
FAO STAT	• Commodity production quantity • Commodity export and import quantity • % of population undernourished • Calorie supply per capita • Net receipt of food aid
FEWS NET	• Monthly commodity prices (retail)
Green Markets	• Monthly fertilizer prices (retail)
World Bank World Development Indicators (WDI)	• Inflation • Agriculture as % of land • Agricultural value added • Foreign Direct Investment • Percent of population below poverty line • GDP • GNI per capita • External debt as percent of GDP
International Monetary Fund (IMF)	• Global oil prices
U.N. Population Division	• Population • Population density
International Labor Organization (ILO)	• Unemployment • Consumer price indexes
UNICEF Statistics and Monitoring	• Children undernourished (%) • Under 5 mortality rate (per 1000)

The **Excessive Food Price Variability Early Warning System** [http://www.foodsecurityportal.org/policy-analysis-tools/excessive-food-price-variability-early-warning-system] consists of real-time tools that measure whether world markets are experiencing periods of increased price variability. It is updated **daily**. The tools provided graph historical periods of excessive global price volatility from 2000-present, and calculate a

[2] The Data API allows users to link to Food Security Portal data in web form or in downloadable spreadsheet-friendly CSV files.

daily volatility status. Policy-makers can use the information to determine appropriate country-level food security responses, such as the release of physical food stocks.

Annotated price timelines for wheat, maize, rice and soybean [http://www.foodsecurityportal.org/policy-analysis-tools/agricultural-annotated-commodity-prices] allow users to combine time series of international agricultural commodity prices dating back to 2007 with other related information such as international exchange rates and oil prices, real-time news stories and synopses of major events related to global commodity (food and non-food) price fluctuations. Forecasts are provided via links to USDA ERS commodity outlook reports (see Section 1.1.5. USDA ERS.)

The **Main Market Players** tools [http://www.foodsecurityportal.org/policy-analysis-tools/agricultural-annotated-commodity-prices] provide data on wheat, maize, rice and soybean production, exports, and imports for the top 25 country producers of the past five years.

The **Agricultural Commodity Prices and Returns** section [http://www.foodsecurityportal.org/policy-analysis-tools/agricultural-commodity-prices-and-returns] presents graphs of up-to-date **weekly** global price data and **daily** returns on future price data for hard and soft wheat, maize, rice and soybeans.

The **Agricultural Input Prices** section [http://www.foodsecurityportal.org/policy-analysis-tools/agricultural-input-prices] presents **monthly** prices for ammonia, urea, potash, and diammonium phosphate.

Country profiles [http://www.foodsecurityportal.org/countries] for 29 countries[3] provide the latest available descriptive information for a large set of food security-related indicators; plots local versus international price for wheat, maize and rice over the previous 12 months; presents food security-related media reports; and, for most countries (but not Indonesia), links to useful food security reports and background research.

The **commodity prices** section [http://www.foodsecurityportal.org/commodities] presents prices for the four main commodities for the period Jan 2007 through the previous month (e.g. May 2012 if accessed in June 2012), with the percent change over the last two months calculated, but not for all countries (for example, Indonesia prices are not available.) **Media reports** relevant to commodity production, prices and trade are compiled, and are updated daily.

In addition to the analytical tools listed above, the portal provides links to a series of tools to help strengthen the capacity of policy makers and institutions. Exhibit 1 contains a list of the **capacity strengthening tools** [http://www.foodsecurityportal.org/policy-analysis-tools/capacity-strengthening] available, including the **policy analytical tools** [http://www.foodsecurityportal.org/policy-analysis-tools/policy-tools] required to measure the impact of a food crisis. The **Food Crisis Reports** [http://www.foodsecurityportal.org/policy-analysis-tools/food-crisis-reports] section presents the latest research on the causes and

[3] Bangladesh, Brazil, Cambodia, Chad, China, Colombia, DR Congo, El Salvador, Ethiopia, Guatemala, Haiti, Honduras, India, Indonesia, Kenya, Lao PDR, Liberia, Madagascar, Malawi, Mozambique, Nicaragua, Niger, Nigeria, Pakistan, Peru, Sierra Leone, Tanzania, Uganda and Vietnam.

consequences of global food crisis, and on key policy responses required to mitigate the food price crisis' negative consequences and enhance food security.

Exhibit 1

Food Security Portal Capacity Strengthening and Policy Analysis Tools

Capacity Strengthening

1. Feeding Minds, Fighting Hunger - A Food Security Curriculum Development Tool for Teachers
2. Implications of Economic Policy for Food Security: A Training Manual
3. Methodological Toolbox on the Right to Food
4. Poverty and Hunger: Issues and Options for Food Security in Developing Countries
5. Food Security in Practice Handbook Series
6. Food Security, Consumption, and Demand Policies
7. Food Production and Supply Policies
8. Food, Agricultural, and Nutrition Policy Research - Basic Data Analysis with SPSS
9. Using GAMS for Agricultural Policy Analysis
10. Using Stata for Survey Data Analysis
11. Introduction to General Equilibrium Modeling for Policy Analysis
12. Policy Analysis for Food and Agricultural Development: Basic Data Series and Their Uses
13. Social Accounting Matrices and Multiplier Analysis
14. Regional Strategic Analysis and Knowledge Support System for Africa
15. IRIN Global Food and Nutrition Jargon Buster
16. Microcomputers in Policy Research Series
17. WTO Food Security Database

Policy Analysis

1. Adjusting Prices for Inflation
2. Seasonality Tool
3. Terms-of-Trade Effect
4. Short-Term Welfare Effects of Higher Food Prices
5. Short-Run Impact of Releasing Food Stocks
6. Short-Term Impact of Tariff Reduction
7. Supply-Demand Model of an Imported Commodity: Import Prices
8. Supply-Demand Model of an Imported Commodity: Import Tariffs
9. Medium-Term Welfare Effects of Higher Food Prices
10. Price Transmission Analysis

Source: Food Security Portal http://www.foodsecurityportal.org/policy-analysis-tools/capacity-strengthening, http://www.foodsecurityportal.org/policy-analysis-tools/policy-tools

1.1.2. FAO Global Information and Early Warning Systems (GIEWS) [http:/www.fao.org/giews/]

GIEWS tracks production, consumption, stock and price data, and produces several very useful publications addressing availability (supply/demand) and access (price) current situation trends and forecasts globally, regionally and by country. They include:

Global Cereal Supply and Demand Brief [http://www.fao.org/worldfoodsituation/wfs-home/csdb/en/] provides a **monthly** update on the world cereal market, with data on

production, utilization (direct consumption, feed, industrial use, biofuel) and stocks forecast for cereals, wheat, coarse grain and rice. July 2012 is the most recent edition.

Global Food Price Monitor [http://www.fao.org/giews/english/gfpm/index.htm] is also supposed to be published **monthly** (although the most recent edition available on the GIEWS website is for Dec 2011.) It describes current food prices at global, regional and country level, with a focus on developing countries.

Crop Prospects and Food Situation [http://www.fao.org/giews/english/cpfs/index.htm] provides a **quarterly** global cereal supply and demand overview and a detailed assessment of cereal production and supply and demand conditions by country and region. It includes a statistical annex with global cereal supply and demand indicators, world cereal stocks, selected international prices of wheat and coarse grains, and estimated cereal import requirements of Low-Income Food-Deficit Countries. June 2012 is the most recent edition.

Of the GIEWS reports, **Food Outlook** [http://www.fao.org/giews/english/fo/index.htm], which is published **biannually** (May/June and November/December), provides the most in-depth analyses of world markets for cereals and other major food commodities, with comprehensive assessments and forecasts on a commodity by commodity basis. May 2012 is the most recent version.

GIEWS also produces **Country Briefs** [http://www.fao.org/giews/countrybrief/index.jsp], which contain a snapshot and assessment of the overall food security situation in the country, events that affect production of key crops, trends in prices of key foods, and export and import trends and forecasts. They are relatively up-to-date and quite useful. Dates of the latest briefs and what was discussed are presented in Table 2 for Indonesia and for three countries that are the main sources for Indonesia's imports of rice (Vietnam and Thailand) and wheat (Turkey).

Table 2

Information in selected GIEWS Country Briefs

Country	Date	Key issues discussed
Indonesia	Feb 2012	1. Good rains favor current cropping season 2. 2011 paddy harvest estimated to decline slightly from record production in 2010 3. Price of rice has been rising last several months to new record level in January 4. Overall food security situation satisfactory but localized food insecurity persists
Viet Nam	Feb 2012	1. 2011 paddy rice production estimated to reach record level at 42 million tons 2. High level of rice exports expected to continue in 2012 3. Domestic price of rice down sharply last two months after reaching record level
Thailand	May 2012	1. Severe floods resulted in losses of the 2011 main season paddy crop 2. Reduced rice exports in 2012 3. Domestic prices of rice have come down since November 4. Overall food security in country is satisfactory
Turkey	Mar 2012	1. Favorable production prospects for winter crops in 2012 2. Cereal exports expected to exceed imports in 2011/12; wheat exports expected to increase 3. Food inflation stabilizes at a high level

GIEWS also publishes **Special Reports**, often reporting on the results of country-level rapid evaluation missions or Crop and Food Security Assessment Missions, and **Alerts** [**http://www.fao.org/giews/english/alert/index.htm**], short reports that describe the food supply and agricultural situation in countries or sub-regions experiencing particular food supply difficulties, and recommend measures to be taken by the international community.

Users can subscribe to receive Special reports and Alerts by e-mail at **http:/www.fao.org/giews/english/listserv.htm**.

GIEWS provides tools to track prices and two key agroclimatic indicators: the Normalized Difference Vegetation Index (NDVI) for the developing world by sub-region, and dekadal rainfall estimates for African countries.

The **Food Price Data and Analysis Tool** [http://www.fao.org/giews/pricetool/] contains 1130 monthly domestic consumer price series in 20 different food commodity categories for 82 countries, and 28 international cereal export price series. Users can search by commodity, country, geographic region or economic group, see basic statistics for each price series (percent changes, standard deviation, etc.), and easily compare prices with a built-in multi-series chart feature. GIEWS plans to expand capacities of the tool, including by integrating a price model to detect anomalies in price trends, and adapting the tool to develop a National Price Tool for use at the country level.

WinDisp [http://www.fao.org/giews/english/windisp/windisp.htm] is a software packet, originally developed for GIEWS, for the display and analysis of satellite images, maps and associated databases, with an emphasis on early warning for food security. It can be downloaded from the GIEWS website. Unfortunately, the NDVI data on the website is not up to date. The most recent NDVI dekad for South Asia (there is no S. Asian country-specific NDVI data available) is from December 2010.

Finally, GIEWS monitors **country-level food policies** [http://www.fao.org/giews/countrybrief/policy_index.jsp] for many countries, including Indonesia and many of the key sources of Indonesian food imports. However, there is no 2012 information available, and for many countries, no 2011 information. The **Country Briefs** contain more up-to-date information.

1.1.3. FAO World Food Situation [http://www.fao.org/worldfoodsituation/en/]

GIEWS information is complemented by information released by FAO under the World Food Situation, much of which is relevant to Indonesia's concerns and much of which feeds into and is used by other FSMEWS.

The FAO **Food Price Index** [http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/] is a measure of the **monthly** change in international prices of a basket of food commodities (cereals, oils/fats, meat, dairy and sugar). Individual price indices are also released for each commodity group. The most recent release of the Index was 7 June 2012.

The **Rice Market Monitor** (RMM) analyzes recent developments in the global rice market, tracks international rice export prices, estimates global paddy production for the previous year, and forecasts global paddy production, rice trade, rice utilization, and rice carryover for the current year, with an explanation on the basis for these forecasts. It is produced approximately every 3 months. April 2012 is the most recent version. Users can access the RMM and subscribe to FAO's Rice Market Network at [http://www.fao.org/economic/est/publications/rice-publications/rice-market-monitor-rmm/en/]

The **Oilcrops Monthly Price and Policy Update** (MPPU) reviews international prices for oilseeds, oils and meals and discusses recent policy and market events that are deemed important for the global oilseed economy. Users can access the MPPU and subscribe to FAO's Oilcrops Market Network at [http://www.fao.org/economic/est/publications/oilcrops-publications/oilcrops-monthly-price-and-policy-update/en/]

1.1.4. Agricultural Market Information System (AMIS) [http://www.amis-outlook.org/]

AMIS is a global agricultural market information system focused on wheat, maize, rice and soybeans. It is a G20 initiative, initiated in response to the global food price crisis in 2007/2008, which aims to enhance the efficiency of global food markets by increasing transparency and information availability and strengthening collaboration and dialogue among main producing, exporting and importing countries, commercial enterprises and international organizations. It is still in the process of development.

AMIS aims to:

- *improve agricultural market information, analyses and forecasts at both national and international levels;*
- *report on abnormal international market conditions, including structural weaknesses, as appropriate and strengthen global early warning capacity on these movements;*
- *collect and analyze policy information, promote dialogue and responses, and international policy coordination; and*
- *build data collection capacity in participating countries. (AMIS webpage)*

Participants in AMIS include G20 countries, including Indonesia; Spain; and non-G20 countries that hold a significant share in global production and trade of commodities covered by AMIS.

The AMIS Secretariat is headquartered in Rome, Italy, and is composed of nine international and inter-governmental organizations that support AMIS's collection, analysis and dissemination of food situation and outlook information: FAO, IFAD, IFPRI, WFP, OECD, World Bank, WTO, the UN High Level Task Force (UN-HLTF) and UNCTAD.

The **Global Food Market Information Group** consists of technical representatives from countries participating in AMIS. They are responsible for ensuring accurate and up-to-date information on production, stocks, trade, utilization and prices (including futures prices). Some countries are still reluctant to buy-in to the AMIS principles of transparency. In fact, some officials within the Indonesia government are critical of sharing information, but so far they have shared almost all the information requested. Especially sensitive is information related to stocks, particularly private sector stocks. Some countries have laws requiring private sector reporting of stock, but Indonesia does not. The Indonesia Focal Point on the Information Group is Tassim Billah, Director, Center for Agricultural Data and Information Systems, Ministry of Agriculture (MOA).[4]

The **Rapid Response Forum** is composed of senior officials from AMIS participant countries. It is designed to promote early discussion among decision-level officials about

[4] Unfortunately, due to budget constraints and conflicting priorities, Pak Billah has been unable to attend any of the AMIS Information group meetings to date.

abnormal international market conditions to encourage the coordination of policies and the development of common strategies. The Indonesia Focal Point on the Rapid Response Forum is Tahlim Sudaryanto, Assistant Minister for International Cooperation, MOA.

Dr. Sudaryanto believes AMIS information will ultimately allow Indonesia to better forecast its production and food security and that of other countries, especially with regards to changes in trade policy that can impact on Indonesia's imports. He sees the main issue as how to effectively follow-up on their involvement in AMIS.

AMIS will produce a **Monthly Bulletin** on market conditions for the five focus commodities, and is identifying/developing **indicators of emerging abnormal market conditions** that might lead to **excessive price volatility** which would trigger an AMIS alert and discussions on appropriate responses in the Rapid Response Forum. (AMIS Secretariat, February 2012)

AMIS Statistics [http://statistics.amis-outlook.org/data/index.html] provides access to the actual and forecast data from various databases. Data are currently available from FAO's Commodity Balance Sheets and USDA's Production, Supply and Distribution database. Global and country-level data on historical and forecast total cereals, coarse grains, maize, wheat, rice and soybeans is currently available only for aggregate production, supply, utilization, trade (exports) and closing stocks. A more detailed View and Compare function is being developed that will allow users to break down the aggregated data into components (e.g. utilization into food, feed, seed, waste and other uses) and compare the numbers provided by the different data sources.

In addition to making data available, AMIS will conduct **in-depth analysis** on related issues, including agricultural futures markets, policy, price transmission and global food security. Another important objective of AMIS, and one that Dr. Sudaryanto particularly highlighted, is **country-level capacity building** to improve market outlook information and improve the quality of data. Dr. Sudaryanto mentioned that Indonesia had benefitted from ASEAN AFSIS capacity strengthening activities and that he hoped to see similar benefits from AMIS.

AMIS efforts in capacity development focus on:

- *defining best practices and methodologies for agricultural market data collection and analyses;*
- *holding a series of regional training sessions to enhance data collection capacity and to assist in the development of methodologies for food market outlook; and,*
- *identifying, designing and implementing special projects to enhance data collection. (AMIS webpage)*

1.1.5. USDA's Economic Research Service (ERS)'s Global Food Security Briefing Room [http://www.ers.usda.gov/Briefing/GlobalFoodSecurity/]

USDA ERS's Global Food Security Briefing Room provides links to a number of reports and databases on U.S. and international food supply and food security. A few of the most relevant are described below, however, the author recommends that readers explore the Briefing Room because of the wide range of material and data available there.

USDA produces **annual** International Food Security Assessments (IFSA), which discuss global food security issues and estimate food gaps for 77 lower income countries. The latest report was issued in July 2011 [http://www.ers.usda.gov/Publications/GFA22/], and provides

projections for three measures of food security regionally and in each of the 77 developing countries for the ten-year period 2011-2021.

The IFSA defines food-insecure people as those consuming less than the recommended nutritional target of ~2,100 calories per day per person. The report projects the **number of food insecure people in each country**, and calculates two gap measures, based on projections of shortages in food availability and lack of access due to insufficient purchasing power: the **nutrition gap**, which is the difference between projected food availability and the amount of food needed to meet the average recommended nutritional target, and the **distribution gap**, which is the difference between projected food availability and the amount needed to increase consumption in food-deficit income groups within individual countries to meet the recommended nutritional target.

To complement the IFSA, USDA makes down-loadable excel spreadsheets available [http://www.ers.usda.gov/publications/gfa-food-security-assessment-situation-and-outlook/gfa22.aspx], which contain country statistical tables and charts for all the countries covered in the report, in North America, Africa, Latin America and Asia. The spreadsheets contain 9 years of historical data on production, imports and food aid (2002 – 2010 for the 2011 IFSA), and one-year, five-year and 10-year projections. Each country sheet also contains two charts, one that graphs grain production and commercial imports over the past 9 years, and a second that graphs the one-, five- and 10-year nutrition and distribution gaps or, for countries with no gaps, grain production and commercial import projections. Databases are also available for the baseline country variables and parameters that feed into USDA projections:

- **International baseline projections** [http://www.ers.usda.gov/data-products/international-baseline-data.aspx]: supply, demand, and trade for major agricultural commodities
- **International Food Consumption Patterns** [http://www.ers.usda.gov/data-products/international-food-consumption-patterns.aspx]: total and marginal budget shares and income and price elasticities for nine broad consumption groups and eight food subgroups
- **International Macroeconomic Data Set** [http://www.ers.usda.gov/data-products/international-macroeconomic-data-set.aspx]: real (adjusted for inflation) gross domestic product (GDP), population, real exchange rates, and other macroeconomic variables

The **World Agricultural Supply and Demand Estimates** report [http://www.usda.gov/oce/commodity/wasde/index.htm] contains **monthly** forecasts of supply and demand for major U.S. and global crops and U.S. livestock. The data in the report is also available in the **Production, Supply and Distribution Online database** [http://www.fas.usda.gov/psdonline/psdHome.aspx]. Users can subscribe to receive the reports via email at http://usda.mannlib.cornell.edu/MannUsda/displayPatronSubscriptions.do?reports=0000.

Monthly Outlooks for Wheat [http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1293], Rice [http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1285], and Sugar and Sweeteners [http://www.ers.usda.gov/publications/SSS/], among other commodities, provide information on supply, use, prices, and trade, by grade, and includes supply and demand projections in major importing and exporting countries.

1.2. Regional FSEWS

2. 1.2.1. Association of Southeast Asian Nations (ASEAN) Asian Food Security Information System (AFSIS) [http://www.afsisnc.org/]

ASEAN's Food Security Information System (AFSIS) is designed to facilitate access to commodity outlooks, early warning, and agricultural statistical data at the sub-national level from the ASEAN nations plus China, Japan and S Korea.

Agricultural Commodity Outlook reports provide useful current and forecasted ASEAN country national and regional information on production, utilization, stock, trade and prices for rice, maize, sugarcane, soybeans and cassava. The report also discusses significant events that impact the production, consumption and trade of the commodities by country. December 2011 is the most recent issue [http://www.afsisnc.org/sites/default/files/publications/aco-no.7.pdf]. See Appendix 1 for the table of contents that illustrates the breadth of information provided.

Early Warning Information reports also present information on current and forecasted production, cultivated (planted and harvested) areas, yields and crop damage for rice, maize, sugarcane, soybeans and cassava. March 2012 is the most recent issue [http://www.afsisnc.org/publications/ewi-report].

Users can query an **on-line database** [http://www.afsisnc.org/statistics/] where data is available for production, yield, exports, imports, farmgate and wholesale prices for the five focus crops. National focal points are responsible for maintaining the database. However, the data is incomplete and not up-to-date.[5] For example, paddy production data for 2011 has only been uploaded by Brunei, Thailand and Vietnam; and for 2010 by Brunei, Cambodia, Indonesia, Thailand and Vietnam.[6] For no year between 2008 and 2011 have data been uploaded by all ASEAN-plus-three countries.

1.3. Country-level FMEWS

1.3.1. USAID's Famine Early Warning System Network (FEWS NET) [http://www.fews.net]

FEWS NET implements a comprehensive FSMEWS in 21 focus countries[7], employing full-time staff in-country and in three regional offices that work in close collaboration with government counterparts. The in-country staff are knowledgeable and experienced food security specialists who interact regularly with government agencies; international, donor and non-governmental organizations; producers; traders and other market actors; media; other civil society organizations and households about the food security situation at the national and sub-national level, including through regular field visits to major markets and production centers, and vulnerable areas.

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[5] Dr. Tassim believes that the timeliness of AFSIS information will improve now that a more user-friendly interface for uploading data has been developed.

[6] Malaysia had uploaded up-to-date paddy production data into the database on the old AFSIS website, but the data do not seem to have been moved over to the new database.

[7] Afghanistan, Burkina Faso, Chad, Djibouti, Ethiopia, Guatemala, Haiti, Kenya, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Somalia, Sudan, South Sudan, Uganda , Zambia, and Zimbabwe.

FEWS NET also conducts "remote monitoring" in 10 countries[8]. It does not maintain offices in these countries. Key food security indicators are monitored for anomalies by FEWS NET staff in nearby country offices, in collaboration with in-country partners.

FEWS NET analyzes three basic types of data (agro-climatic, agricultural production and livelihood options, and market) to identify potential threats to food security, and uses the Integrated Acute Food Insecurity Phase Classification System and approach (see Section 1.3.2.) to classify areas and population groups by degree of acute food insecurity, and to issue short- and medium-term outlooks and alerts. Remotely-sensed and ground-based early warning data are collected, analyzed and disseminated on an ongoing basis to produce a series of regular reports, and periodic alerts and special reports. See Exhibit 2 for a list of FEWS NET products with up-to-date issues on the website.

FEWS NET lays the groundwork for its FSMEWS by conducting food security and vulnerability, livelihood (means of living) and market assessments. All of these are essential steps for understanding the food security situation and identifying vulnerable areas and population groups within a country, identifying what and where the key indicators to monitor are, and interpreting the early warning information collected.

FEWS NET has created **Livelihood Zone Maps** for all of its focus countries, which divide the country into areas where people broadly have the same sources of livelihoods and interact with and depend on markets in a similar way. Livelihood zones are defined by geography, which affects both production options (climate, soil, topography, etc.) and marketing/trade opportunities (roads, proximity to urban centers, etc.), which, in turn, affect consumption by the household; characteristics and use of agricultural production, and market access for trade and labor (FEWS NET Web Page). They also create **Seasonal Calendar and Critical Events Timelines**, and **Livelihood Seasonal Monitoring Calendars** that present information on the seasonality of sources of food and income by wealth group to identify which variables are important to which wealth groups in each zone, and thus which variables are important to monitor and when.

Livelihoods are the means by which households obtain and maintain access to essential resources to ensure their immediate and long-term survival…. FEWS NET's livelihoods framework is the lens through which early warning information is interpreted and the basis of analysis for decision support….[It] is used to identify geographically relevant variables for monitoring systems and to interpret monitoring and field data. It provides analysts with a means to predict and judge the impact of a shock on household income and food access. (FEWS NET Web Page)

See Figure 1 for the Livelihood Zone Map for Niger, Exhibit 3 for a Livelihood Profile for one of Niger's Livelihood Zones (Niger River Irrigated Rice), Figure 2 for the Food, Income and Expenditure Cycles of the Poor and Seasonal Calendars for Niger's Irrigated Rice Livelihood Zone, and Figure 3 for the Livelihood Seasonal Monitoring Calendar for Niger's Niger River Irrigated Rice Zone.

[8] Burundi, El Salvador, Honduras, Liberia, Nicaragua, Senegal, Sierra Leone, Tanzania, Tajikistan and Yemen.

Exhibit 2

FEWS NET Reporting Products

Food Security Updates
Monthly report with comprehensive coverage of current and projected food security conditions and their implications.

Alerts
One page statements issued when a crisis is emerging or deteriorating or when early action is recommended.

Food Assistance Outlook Brief
Two-page monthly summary and analysis of food security threats in FEWS NET countries.

NOAA Weather Hazards Impact Assessments
Weekly assessment of current weather conditions and their impact on food security in Afghanistan, Africa, Central America, and Haiti

Rain Watches
One page report issued every 10 days that assesses the progress of the current rainy season and its implications for food security in a specified area.

Cross Border Trade Reports
Periodic reports on cross border trade in key food commodities.

Special Reports
Periodic reports issued by FEWS NET and partners that cover a broad range of topics and geographic areas.

Reports and Studies
Distinct from regular reporting (monthly updates), market studies aim to enhance the knowledge base on markets and food security.

Market Reviews
An overview of market networks, key market relationships, and basic market dynamics, taking into consideration both national and regional factors and tailored to the FEWS NET audience and working environment. Recommendations for the incorporation of markets into regular food security monitoring, analysis, and early warning are also provided.

WRSI Reports
Monthly report analyzing the water balance for maize and bean crops in Central America (Spanish only).

Darfur Crisis: Rain Timeline and Forecast
Two-page weekly report, issued May-October, on the progress of the seasonal rains and their impact on humanitarian access to sites in Darfur and eastern Chad.

Source: FEWS NET Web Page http://www.fews.net/ml/en/product/Pages/default.aspx accessed 6/25/12.

Figure 1

Livelihood Zone Map, Niger

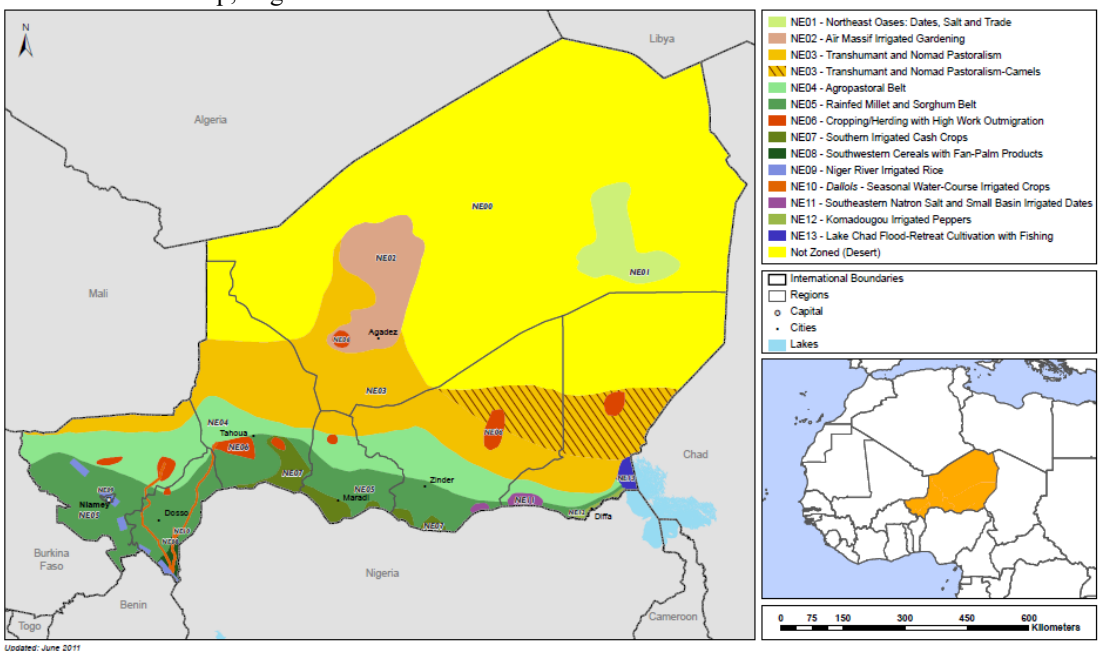


Exhibit 3

Niger's Niger River Irrigated Rice Livelihood Zone Profile

Zone 9: Niger River Irrigated Rice [12]

Food Security Monitoring Priority

Low: Relief food/cash 1 year in 5

Key Livelihoods Activities

Poor	Better-off
Paid agricultural labor rainfed cultivation	Irrigated rice and tobacco cultivation
Irrigated rice cultivation	Rainfed cereals production
Firewood sales	Livestock rearing
Very small-scale market gardening	Market gardening
livestock keeping (small)	Fishing

Staple foods and sources

Poor	Better-off
Millet, sorghum, rice purchase	Own rice and sorghum
Own sorghum and rice (c30%)	Sorghum purchase (small)

Main income sources

Poor	Better-off
Paid labor	Rice sales
Rice, firewood, fish, vegetables (small) sales	Tobacco sales
	Livestock sales
	Vegetable sales

Most Important Productive Assets

Poor	Better-off
Labor capacity	Irrigated land
Irrigated land	Rainfed land
Rainfed land	Oxen and ploughs (a few run tractors)
Hoes, fishing lines	Motor-pumps
	Canoes and fishing nets

Main Markets

Rice: Production areas -> Niamey (much via Ayorou and Tillabery collection markets)

Tobacco: mostly traded into Burkina Faso

Livestock: local markets -> Niamey; -> Balleyara -> Bela -> Benin/Nigeria

Shocks and Hazards

Rainy season: flooding (July/August – 1 year in 3)

Dry season: water breaching river banks (Dec. / Jan. – 1 year in 5)

Hippopotamus damage (July-Sept. - yearly risk)

Insect pest on rice (May-June first harvest)

Bird pest on rice (October-December – second harvest)

Key Early Warning Indicators

Monitoring of shocks as above

The Niger river zone is composed mainly of areas under officially controlled irrigation schemes, notably at Ayorou and Tillabery, but includes smaller areas of informal irrigation or flood retreat cultivation. Although this zone is dominated by irrigated rice production (together with some tobacco) almost all farmers also engage in rainfed sorghum cultivation (with some millet) beyond the immediate river area (together with some rainfed rice in certain localities). The sorghum is very largely for domestic consumption, while rice is at least as much a cash crop as a daily staple. (Local rice is of higher quality and normally at a higher price than imported rice.) **Poorer households cultivate very small, irrigated plots** of a quarter-hectare or less. If they are able to devote the labor and inputs, this can still bring important profits. **But their sorghum on 1-2 hectares of rainfed land is important to their food security.**

In the north of the zone rainfall is less abundant and less trustworthy than in the south. Acute **food insecurity due to rainfed crop failure** is therefore somewhat more a northern than a southern phenomenon. But it **is moderated by the irrigated production, not only because this does not rely on local rainfall but because it is a very labor-intensive business that guarantees substantial employment for poorer villagers** (although a minority still need to go on work migration).

Livestock, especially cattle, are not easy to keep in an irrigated zone – it requires extra work/contract herding to graze them well away from the rice paddies, which may be cultivated all year for two harvests. Nevertheless, apart from oxen for traction, **wealthier farmers do keep modest numbers of cattle, whilst poorer people tend rather to have a handful of sheep or goats**, as well as poultry, which are commonly most important for the poorest as money-earners. Fishing is a common secondary activity, bringing an important addition to the diet as well as cash from sales (fresh, dried, smoked).

Figure 2
Food, Income and Expenditure Cycles of the Poor and Seasonal Calendars, Niger Irrigated Rice Livelihood Zone

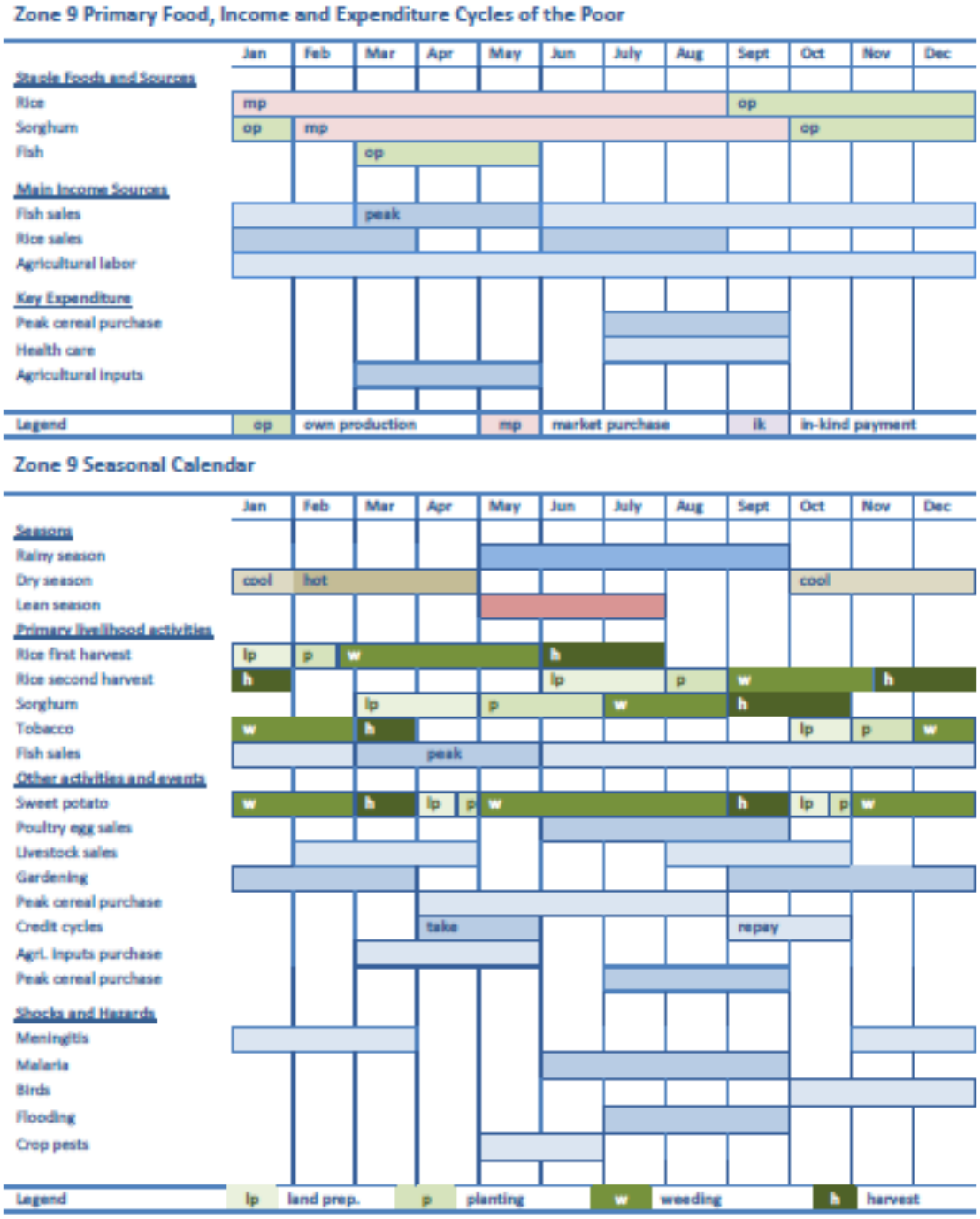
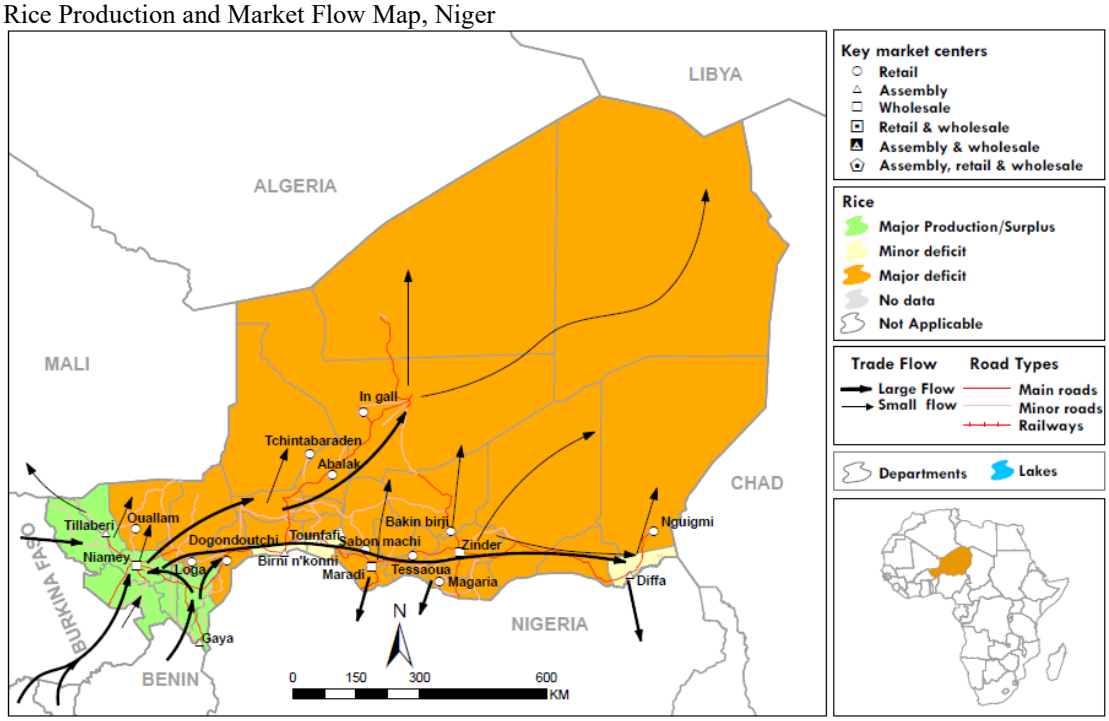


Figure 3
Livelihood Seasonal Monitoring Calendar for Niger's Niger River Irrigated Rice Livelihood Zone

FEWS NET assesses then monitors markets to understand and measure household food access and the ability of markets and households to respond to production and other supply shortfalls and market disruptions. FEWS NET has created **Production and Market Flow Maps** for all countries and regions of coverage as a geographic baseline of market networks. These maps identify and locate surplus production areas, deficit production and consumption areas, and market centers (assembly, wholesale, retail and cross-border market points, if relevant), and map the flows of commodities between markets. As required, Production and Market Flow Maps are created by season, and for normal and crisis years. See Figure 4 for the Production and Market Flow Map for rice in a normal year in Niger.

Production and Market Flow Maps provide a summary of experience based knowledge of market networks (catchments and commodity flows) significant to food security: basic grains, livestock, and labor. Maps are produced by US Geological Service and FEWS NET in collaboration with local government ministries, market information systems, UN agencies, NGOs, other network partners and market actors." (FEWS NET Web Page)

Figure 4
Rice Production and Market Flow Map, Niger



FEWS NET monitors agro-climatic conditions in collaboration with the U.S. Geological Survey and U.S. National Oceanic and Atmospheric Administration, although only the Rainfall Estimation images are up-to-date (June 2012.) The remaining three satellite imagery indicators are older [Normalized Difference Vegetation Index, an indicator of the vigor and density of vegetation on the ground (March 2010); Water Requirements Satisfaction Index, an indicator of crop performance based on the availability of water to the crop during a growing season (August 2011); and Inter-Tropical Convergence Zone, the northern limit of the rain belt over West Africa which forms the dividing line between the southwestern winds and the northeastern surface winds (October 2011)].

1.3.2 Integrated Food Security Phase Classification

The **Integrated Food Security Phase Classification** (IPC) combines availability; access, including livelihoods; and utilization indicators and information in a standardized scale to classify the nature, severity and location (geographic and population groups) of food insecurity in a country, and identify what is needed in terms of a response. It was originally developed for use in Somalia by FAO's Food Security Analysis Unit. Several national governments and international agencies, including CARE International, European Commission Joint Research Centre (EC JRC), FAO, FEWS NET, Oxfam GB, Save the Children UK/US, and WFP have been working together to adapt it to other country and food security contexts.[9]

Core to the IPC approach is a **broad-based consensus-building process** engaging key stakeholders including governments, UN agencies and NGOs, donors, the media, and target communities, working together to determine the appropriate level of food insecurity to assign to each area.

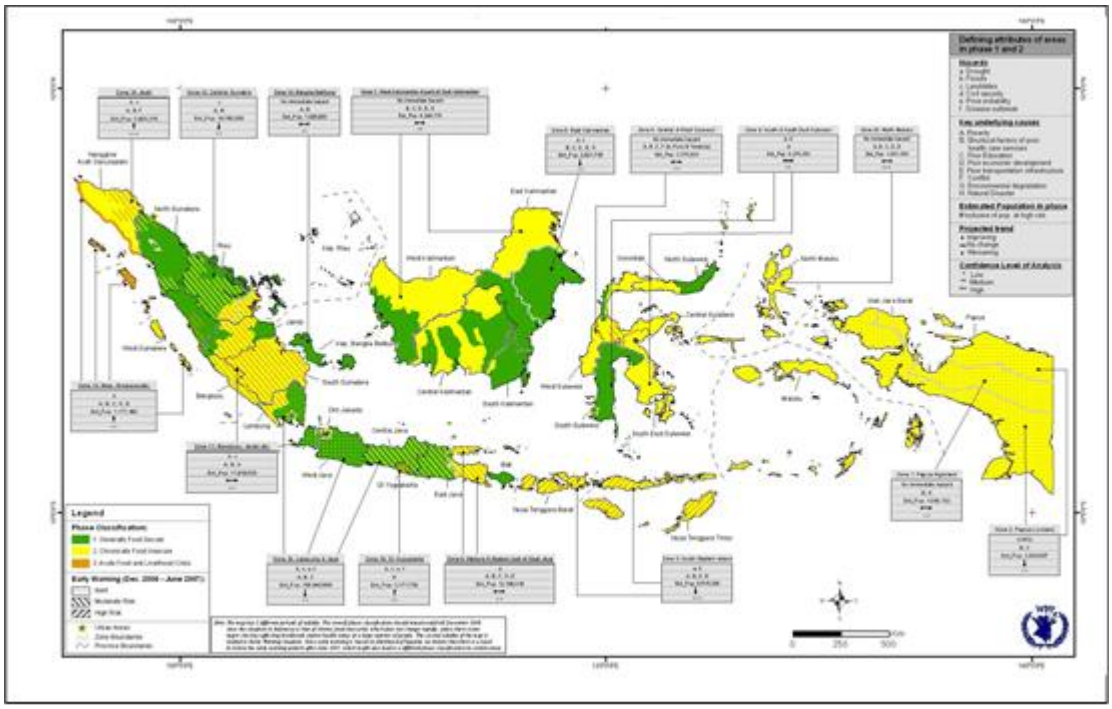
[9] Unfortunately, a new IPC website has been under construction for more than a month, so the author was unable to access a list of countries, in addition to those covered by FEWS NET, that are currently using the IPC approach and/or reference tables.

The IPC classifies food security and humanitarian situations into phases, based on a series of indicators that measure food security outcomes and their determinants, including immediate hazard events, underlying causes, and the specific vulnerabilities of livelihood systems in the country or area. The tool allows users to classify the current or imminent situation for a given area and/or population group, and predict the likelihood and severity of a potential further deterioration of the situation.

Outcomes are categorized using internationally accepted standards, however, the IPC does not mandate that every country use the same indicators. It deliberately allows for flexibility based on what information is available by including a range of measures that can be used to categorize different aspects of food security. Each phase is associated with a strategic response framework.

The IPC was piloted in Indonesia in 2006. At the time, however, Indonesia was not experiencing severe food insecurity. The IPC correctly classified the food security situation in Indonesia (see Figure 5), but, because the version of the IPC piloted (version 1) combines acute food insecurity and chronic food insecurity into the same scale and does not disaggregate chronic food insecurity into varying levels of severity, the exercise did not result in very useful differentiation to support food security program decision-making (Nicholas Hann, FAO, Personal communication). An IPC Version 2 is being developed, in which acute and chronic food insecurity will be classified on separate scales. FEWS NET adopted the revised Acute Food Insecurity Reference Table in 2011. FAO has developed a prototype Chronic Food Insecurity Reference Table and will be piloting and further developing it this year. See Appendix 2 for the Version 2 Acute and Chronic Food Security Reference Tables.

Figure 5
IPC Map of Indonesia 2006 using IPC Version 1 Reference Table



Legend: Green = Generally Food Secure, Yellow = Chronically Food Insecure, Orange = Acute Food and Livelihood Crisis
Source: WFP. Executive Brief: Indonesia Food Security Assessment and Classification. http://www.wfp.org/content/indonesia-food-security-assessment-phase-classification-pilot-february-2007 accessed 6/25/12 (World Food Program, 2007)

1.3.3. WFP Cambodia

In 2009, WFP commissioned a stocktaking of their FSMEWS (World Food Program, 2009), which identified many areas where WFP FSMEWS could be strengthened. The WFP Indonesia Price and Food Security Early Warning Monitor, discussed in more detail under Section 2 of this report, is an example of a WFP FSMEWS that could be strengthened in several of the areas highlighted in the stocktaking report, including by:

- monitoring food security and livelihoods at various aggregation levels (household, local, national and regional)
- incorporating indicators of utilization in addition to availability and access.
- ensuring the FSMEWS is demand-driven and responds to the needs and priorities of various users
- ensuring that ownership and ultimate responsibility for implementing the FSMEWS lies with the national government

The WFP-supported FSMEWS in Cambodia, on the other hand, exemplifies many of these recommendations and FSMEWS best practices, and is a good example for Indonesia to consider. The Government of Cambodia manages it through a Secretariat for a multi-sectoral, multi-disciplinary Technical Working Group (TWG) for Food Security and Nutrition. Participants on the TWG include the Council for Agricultural and Rural Development, the MOA, Forestry and Fisheries, the Ministry of Water Resource and Meteorology, the Ministry of Health, the National Committee for Disaster Management, the National Institute of Statistics, the United National Children's Fund (UNICEF), WFP, FAO, the World Health Organization (WHO), and food security and nutrition project implementers. In addition to the TWG, there are a number of sector-specific working groups and forums. Examples include Food Security Forum (Council for Agricultural and Rural Development); Infant and Young Child Feeding Working Group (Ministry of Health); Inter-Ministerial Technical Committee - National Council for Nutrition (Ministry of Planning); Nutrition Working Group (Ministry of Health) and System of Rice Intensification (SRI) Working Group.

The Secretariat maintains a **Food Security and Nutrition** website [http://www.foodsecurity.gov.kh/]. The website contains searchable databases of recently completed, ongoing or planned food security and nutrition projects, and of organizations working in food security and nutrition in Cambodia. Users can search for all organizations working e.g. in a specific field of food security or nutrition, or in a specific province. These tools must be very valuable for facilitating and encouraging collaboration and avoiding duplication.

The Cambodia Food Security and Nutrition website facilitates the dissemination of best practices and lessons learned, highlights innovative measures, inform users of news and events, and promotes open discussion among stakeholders, with regard to food security and nutrition issues in Cambodia. It enables people and organizations interested and involved in food security and nutrition issues both within and outside Cambodia to share information, and to build and preserve a repository of knowledge about food security and nutrition for the long term. (Cambodia Food Security and Nutrition Home Page)

The Cambodia **Food Security and Nutrition Quarterly Bulletin** [http://www.foodsecurity.gov.kh/bulletin] is a good practice FSMEW publication that provides a regular overview of trends and emerging threats relating to food and nutrition security in Cambodia. It provides data on environmental conditions and disasters, food production, food prices, health and nutrition, and household coping strategies. Information is concisely summarized on the first page, with more detail provided on subsequent pages. Data is presented in tables, graphs and maps, and all data are accompanied by narrative that

explains causes and describes short-term implications. The bulletin also transparently discusses data issues and limitations. The Bulletin is based on "*secondary analysis of government administrative data and publically available data on a list of standard indicators – from regularly collected government data – agreed upon in the terms of reference of the Food Security and Nutrition Data Analysis Team.*" (TWG, 2012). The author encourages readers to examine Issue #6 January-March 2012 [http://www.foodsecurity.gov.kh/sites/default/files/Quarterly-FSN-Bulletin-No6-Eng.pdf].

2. FSMEWS Best Practices and Indonesia's Experience

Food security monitoring tracks food security conditions and trends at the national, sub-national, community and household level. Food security early warning adds a focus on risks and hazards and on unusual or anomalous patterns or behaviors and uses this information to forecast how food security conditions are likely to evolve in the short- and medium term, and make recommendations on how to respond. Forecasts and alerts must be issued with enough lead time (the "early" in early warning) for appropriate policy decisions and program actions to be taken.

Indonesia does not currently have a FSMEWS per se. There are a number of different data tracking and analysis efforts implemented by different agencies, and a high-level ministerial forum exists where data and trends are discussed, and responses to potential food security issues determined. This section presents in general terms some FSMEWS "best practices", and summarizes the current situation in Indonesia with respect to each of them. The next and final section provides recommendations on actions to strengthen food security monitoring and early warning in Indonesia.

Best Practice 1: Collaborate and communicate, promote stakeholder networks and establish "experts groups" and other forums where multi- and cross-disciplinary and multi- and cross-sector exchange can happen with public and private sector actors

High-level, political support for addressing food security and nutrition issues in a country and for supporting the integration of food security and nutrition considerations and approaches across government agencies is essential for effective application of food security strategies, policies and programs. This includes high-level support for establishing and empowering some kind of multi-disciplinary and multi-sectoral food security unit to oversee, manage and coordinate food security and nutrition actions; and creation of food security coordination bodies, at political and technical, and central and decentralized levels.

For effective FSMEWS, a broad-based consensus-building process engaging key stakeholders is necessary for truly understanding what is happening with regards to food security in a country and in specific vulnerable and/or affected areas and population groups. The need for multi-sectoral and multi-disciplinary collaboration and communication begins when designing the FSMEWS and applies all the way through data collection, analysis interpretation and response planning.

Indonesia's experience

Food security policy and actions are decided at regularly-scheduled (and ad-hoc, as needed), ministerial-level Food Security Council (FSC) coordination meetings, convened and overseen by the Coordinating Minister for Economic Affairs (Menko). The Ministry of Health is under the Coordinating Ministry of Social Affairs, and is not represented at FSC meetings.[10]

The Central Bureau for Statistics (BPS), Bureau of Logistics (Bulog), MOA [Food Security Agency (FSA)], MOT, Ministry of Industry, and Ministry of Transportation are key food-security-related line ministries and institutions represented; each ministry presents information on issues within their purview. It does not appear that there is regular participation by non-government agencies at the FSC meetings. The FSC will invite outside private sector participation if there are particular issues to discuss, e.g. Sugar Board representatives will be asked to attend if there are sugar-related issues to discuss. Individual ministries may also reach out to external food security actors to get information that helps explain anomalies. For example, MOT will call traders when observing anomalous price behavior for a particular commodity or in a particular place.

The meetings usually focus on price level and disparity among regions, inflation, availability and stability of strategic food commodities. Demand is considered to be relatively stable, except during major holiday periods such as Idhul Fitri, Christmas, and New Year. The Meteorological, Climatological and Geophysical Agency (BMKG) provides a three month forecast, particularly early in each production cycle. FSC members will analyze, discuss and interpret price behavior at the international, national and provincial level – import, retail, consumption, farm-gate, early warning data and signals (climate/weather, price, production, stocks, export and import) and decide on response options. If there is conflicting data provided by different ministries, the group may need to discuss multiple response scenarios, although conflicting data is mostly reconciled by Menko before each FSC meeting.[11]

The different mandates and priorities of each Ministry (e.g. MOA's interest to protect farmers and encourage national self-sufficiency in production of key commodities, MOT's interest in price stabilization) can cause tensions and lead to challenges in coordination and consensus-building. Differing and sometimes conflicting data provided by different ministries can contribute to the problem. It must also be challenging for Menko to manage the natural tendency to assume the cause of a problem lies within the purview of a different ministry (e.g. if retail prices are going up, MOA will say the problem lies with distribution while MOT will assume the problem is insufficient production or stocks.)

Best Practice 2: Establish a thorough, baseline understanding of food security, livelihoods, vulnerabilities and markets

FSMEWS cannot function effectively without a thorough understanding of the ways in which people access food (own production, purchase, food aid, etc.), so the system identify and monitor the hazards that can threaten access to sources of both food and income. These sources will vary in terms of type and relative importance according to a household's

[10] The MOA Food Security Agency Secretary explained that there are other forums available to address nutrition problems.

[11] The information on Menko's role in harmonizing and resolving data conflicts was provided by the FSA Secretary. Because she was unable to meet with Menko staff or obtain examples of Mekco documents, the author was unable to confirm whether and how Menko accomplishes this.

geographic location and wealth. Knowing how they vary helps determine how different households and wealth groups, within a given area, will be impacted by the specific hazards, and if the food security situation will be affected (Egedorf, Magadzire, & Tarakidzwa, January 2008). A comprehensive food security and vulnerability assessment (FSVA) is thus essential to provide the basis for effective food security monitoring and early warning of population groups where food security might be at risk (World Food Program, 2009). Developing livelihood profiles is another important element required to establish the basis for effective FSMEWS. FSVAs and livelihood profiles help identify important indicators to monitor [e.g. terms of trade relevant to the main livelihoods of different vulnerable groups (e.g. livestock/cereal or casual labor/cereal)] and allows an analyst to understand and predict whether and how different risks will affect different vulnerable groups at different times of the year. FEWS NET identifies three levels of livelihood profiling, which represent increasing levels of detail and understanding of livelihoods, but require increasingly detailed data collection (see Table 3.)

Table 3
Key Products of Livelihood Profiling

Product	Purpose	Source of Information
Livelihood Zone Map	Divides the country into homogenous zones within which people share broadly the same pattern of livelihood, including options for obtaining food and income and market opportunities. It provides geographic orientation for food security analysis and assistance targeting; a basis for identifying geographically relevant monitoring indicators; and a sampling frame for food security assessments and future livelihood zone profiling or baseline development.	*National and Sub-administrative Levels* Secondary Data National and Sub-National Key Informants
Livelihood Profiles	Provide a snap shot of livelihood options (food and cash sources) for households in each livelihood zone, including a brief economic differentiation between groups (wealth groups) and the hazards to which they are vulnerable. They provide the livelihood context for understanding vulnerability to particular events and *potential* risk.	*Sub-administrative and Community Leader Level* District Key Informants Traders/Markets Community Leaders and Representatives
Livelihood Baselines	Provide a detailed quantified breakdown of household livelihood options (food, cash and expenditure patterns) and coping capacity/expandability for different wealth groups in the livelihood zone, highlighting market linkages and constraints and opportunities for economic growth. They provide information to determine risk of food insecurity given specific hazard events, including quantification of food and income deficits as well as numbers of people in need.	*Sub-administrative and Wealth Group/ Household Level* District Key Informants Traders/Markets Community Leaders Household Focus Groups

Source: FEWS NET website http://www.fews.net/pages/livelihoods-product-comparison.aspx?loc=6&l=en Accessed 6/23/12

Understanding markets is essential to effectively monitoring food security and predicting where food security might be at risk. Understanding markets is important not only from a food provisioning perspective – markets are important as sources of agricultural and other productive inputs and of labor and employment. Without understanding how markets work, a

food security analyst is unable to effectively predict supply and demand responses in normal conditions and when shocks occur or are likely to occur.

Understanding markets and how they work helps identify geographic areas that are likely to be affected by food security problems, even when the problem occurs in another geographic area. Understanding how production flows from surplus to deficit areas and what are the main sources of food for deficit areas are important because the effects of a hazards and reductions in the supply of food are not necessarily restricted only to the area in which they occur. A best practice approach to understanding markets is to describe and map the market networks for the food commodities that are the main contributors to food security.

"A market network describes commodity flows and points of exchange from production to the final consumer. The emphasis of market networks is on spatial and exchange relationships (Bonnard & Sheahan, 2009, p. 1)"

Indonesia's experience

The MOA FSA and WFP published a comprehensive FSVA in 2009: A Food Security and Vulnerability Atlas of Indonesia (Dewan Ketahanan Pangan, Departemen Pertanian Rl and World Food Program (WFP), 2009). The 2009 Atlas updates the first Food Insecurity Atlas, published in 2005. The Atlas presents information on the three food security components of availability, access and utilization; describes where the greatest vulnerability to food insecurity is and how many people are estimated to be food insecure; and identifies the principal determinants and risks of insufficient or inadequate availability, access and utilization. The Atlas maps the distribution of food insecurity at the district level for each of the indicators considered, ranks and maps Indonesia's districts by a composite measure of food insecurity, and identifies and prioritizes the 100 most food insecure among them. The Atlas is a very important and useful document that supports targeting and appropriate program design. It will be updated in 2013. (WFP, personal communication.)

The provincial Food Security Office (FSO) and WFP published provincial-level Food Security and Vulnerability Atlases during 2010 for Nusa Tenggara Barat and Nusa Tenggara Timur (NTT), and plan to complete an Atlas for Padua during 2012. The provincial Atlases disaggregate food security indicators to the sub-district level, using small area estimation based on the 2010 census.

The FSA, the NTT FSO, FAO, UNICEF and WFP identified livelihood zones and mapped them for NTT province in 2010. (FAO, UNICEF, WFP, February 2010). No other livelihood mapping appears to have been conducted for Indonesia.

The MOT conducted an extensive market flow study on rice, cooking oil, meat, among other commodities, in 2005, although it does not seem to be used much as a reference. They plan to update it in 2013. The MOT and SEADI are planning to conduct a study of inter-regional trade in rice and sugar during 2012 that will provide the basis for on-going monitoring of sugar and rice production and trade across provinces, and help the MOT to identify and advocate for solutions, such as improved infrastructure, to address internal market problems. WFP's Disaster Management and Logistics unit completed a very comprehensive logistics

capacity assessment in Aceh last year and is conducting assessments in other WFP target provinces.

Best Practice 3: Collect, analyze and present accurate and timely data on a range of food security status and early warning indicators at an aggregated and disaggregated (sub-national) level, both quantitative and qualitative

The adage "garbage in, garbage out" not surprisingly applies to FSMEWS. If the data on which the system relies is not accurate and timely, the system will not be reliable, forecasts may be questioned and the critical link between information and appropriate, timely action will be weakened.

Monitoring conditions at the national, regional and international levels provides important contextual information, and for some purposes, will also be directly relevant to early warning, for example, for decision-making on government food imports, or when surplus areas across borders are important source for deficit areas within the country. However, if the purpose of the FSMEWS is to provide early warning of potential food insecurity problems at the household level, disaggregated, sub-national data needs to be collected and analyzed. Data should be disaggregated geographically, and the effects should be analyzed for different livelihood groups. For example, monitoring national average prices does not provide useful information to determine whether households are facing a potential decrease in purchasing power, because not all households face the same prices across a country.

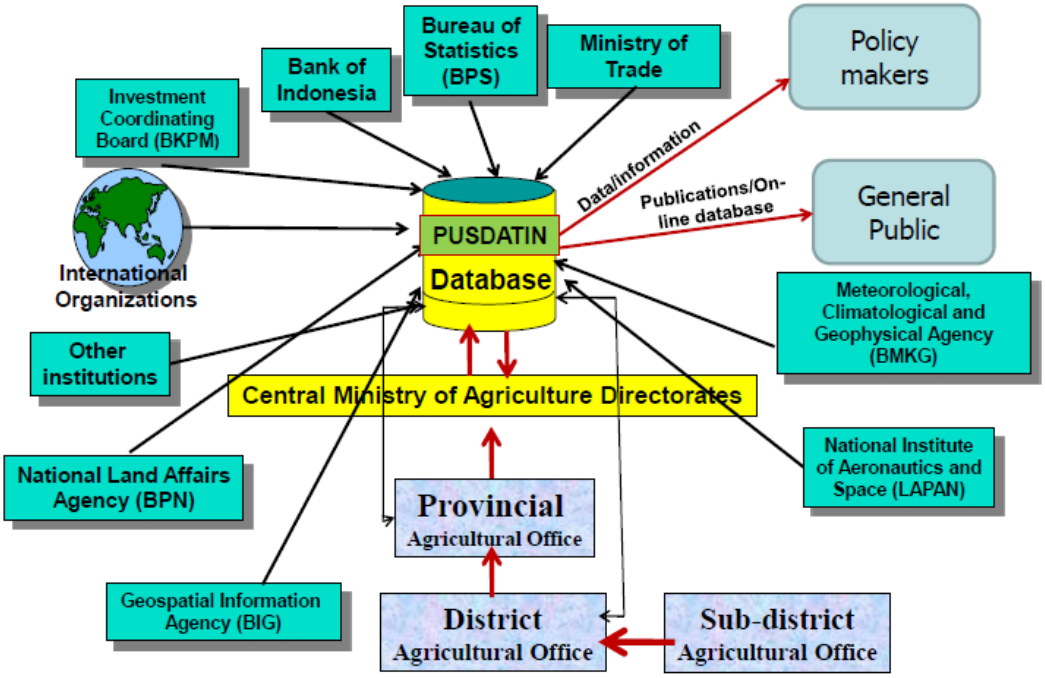
Indonesia's experience

A lot of food security-relevant data are collected by a lot of agencies. BPS collects data directly, consolidates data from other government agencies, analyzes data and develops forecasts. BPS data is analyzed and presented by relevant Ministries in the regular Menko FSC meetings. BPS data includes weekly and monthly average prices for a range of food commodities and consumer price index (CPI) estimates based on data collected in 66 cities (the number of cities will expand to 82 in 2012); estimated actual and forecasted agricultural production for food (paddy rice, corn, soybeans, peanuts, green beans, cassava, sweet potato), horticulture and estate crops; and estimated consumption for key food commodities. BPS conducted a new cost of living survey in 2012 (in cities only), to change/update the basket of commodities used to estimate the CPI, and a Farmer's Terms of Trade study. The MOT collects daily prices for a range of food products in the capital cities of 33 provinces. Regional MOT officers collect daily data from already selected markets and report them by fax and SMS to MOT/Jakarta. MOT staff can see the data daily on an internal website, and the previous day' price is announced publically daily via newspaper and radio.

For some commodities, food price variability across provinces is very high, reflecting poor market integration. The issues are both production- and logistic-related (Kiyoshi Taniguchi, personal communication.)

The MOA Center for Agricultural Data and Information System also compiles official data from numerous sources (see Figure 6), and makes agricultural statistics publically available through an on-line database [http://aplikasi.deptan.go.id/bdsp/index.asp].

Figure 6
Data Flow to and from MOA Center for Agricultural Data and Information Systems (PUSDATIN)



BPS uses BPS estimates of yield and MOA estimates of harvested area to estimate actual production, and forecasts production based on analysis of time series data. BPS issues two public and three internal forecast of total production annually. It updates the forecast for total annual production after each agricultural cycle (January-April; May-August, and September-December) by combining estimated actual production for the completed cycle(s) with forecasted production for the remaining cycle(s). Estimates of area harvested is collected at the local level by local government agriculture agents, sent to BPS district level which processes the data, forwards to provincial level which then forwards to central level.

BMKG tracks and forecasts agro-climatic conditions. However, BPS does not factor weather and other climate conditions in production forecasts, nor does it factor in information on crop pest and disease outbreaks. It is discussing incorporating weather and climate satellite information with the MOA, BMKG and the National Institute of Aeronautics and Space (LAPAN). (Note, WFP and LAPAN had been collaborating to produce an Early Warning Bulletin on Natural Hazards but the work was suspended last year when WFP lost its GIS expert. They are reinitiating the collaboration now, and WFP's goal is for MOA and LAPAN to assume greater ownership of the product.)

Given Indonesia's 17,000 islands, the inter-island transportation situation is clearly a critical determinant of food access. BMKG tracks and forecasts ocean conditions and will put out an alert if conditions will interfere with inter-island traffic (e.g. if waves will be above 2 meters.)

Information of stocks is felt to be the weakest link in determining the national rice balance. Bulog can provide data on the rice stocks it holds, but there is no reliable information on the amount of rice stocks held in the private sector (traders, producers, households) The MOT is currently conducting a study to try to better predict rice stocks. Because they are estate crops and involve centralized processing, production and stock information is felt to be better for sugar and palm oil. However, the Sugar Board is stronger than the Palm Oil Board. It holds

regular meetings, collects data regularly, and provides better production, stock and price information and forecasts.

Consumption and expenditure data come from the National Socio-Economic Survey (Susenas). Susenas is population-based cross-sectional multi-purpose socio-economic household survey implemented by BPS. Until 2010, Susenas was conducted annually. To improve the accuracy of the data generated and to support the increasing frequency of requests for socio-economic data for a variety of purposes, BPS started conducting Susenas on a quarterly basis in 2011. Because of changing methods, comparing different Susenas rounds can be problematic.

Susenas expenditure data include average expenditure of the population broken down by type of food and non-food, the average consumption of the population broken down by type of food, the average consumption of calories and protein, prevalence of poverty and Gini coefficient. Consumption data include average calorie and protein consumption per capita per day, and food and non-food consumption patterns.

The 2012 Susenas total sample is 300,000 households; 75,000 households are interviewed each quarter. Quarterly data are representative at the national and provincial level, while the total sample is representative at a district level. Data are usually available 5-6 months after enumeration.

Rosner and McCulloch document a number of data quality issues with BPS rice production and consumption estimates. Estimates of consumption are much lower than official production figures. If the consumption and production data were accurate, Indonesia would be a net rice exporter, when in fact it is a net rice importer. The Susenas numbers do not come close to numbers that would back into national accounts. Production data quality issues come mainly from how harvested area is estimated (by "eye" by local agriculture extension agents), although there are also concerns with the accuracy of the yield estimate. Consumption is underestimated because Susenas does not measure consumption outside the home and does not account for industrial use. (Rosner & McCulloh, 2008). Susenas also does a poor job reaching very poor households, and collecting data from the moderately rich (because of high non-response rates) (Stephen Marks, personal communication.) The World Bank key informant, on the other hand, felt the Susenas data is fairly good now, although data from some rounds (e.g. Feb 2008 data) are questionable. There is a lot of regional variation in consumption patterns, and the number of households consuming some products in some provinces is very low, making it difficult to conduct rigorous demand analysis for those products in those provinces.

Recognizing the data quality issues with current methods of estimating paddy cultivated area, MOA is mapping paddy area based on satellite data in collaboration with LAPAN. MOA has obtained pilot satellite information on paddy areas for Java in 2010 (see Figure 7) and would like to obtain the same information for other production areas and, importantly, update the 2010 imagery to obtain more accurate and up-to-date estimates of cultivated paddy area through on-the-ground geo-referencing. However, this would require substantial resources (e.g. for purchase of GPS devices for the ~6,600 village-level agricultural extension agents), which the MOA does not currently have.

Figure 7
Wet Land Map of Pagerharjo Village (Scale 1:2500), 2010

BPS is preparing to conduct an agricultural census in 2013.

The FSA has developed guidelines for provincial and district level collection and working group analysis of a range of food security status and early warning indicators, and the consistent and timely collection of them could make an important contribution to local-level food security warning capacity to complement and feed into a central-level FSMEWS. However, provincial- and district-level implementation of the guidelines has been variable to date. As a central ministry office in a decentralized system, FSA does not have the authority to mandate implementation of these local-level systems.

The World Bank is working with the MOT to improve the quality of data in the MOT's Market Monitoring System. Data quality issues include the existence of parallel MOT and BPS databases and the different data collection methods used in each system, and lack of quality control in data input. Price data collection is done in a "strange" way and varies from region to region. Different groups are contracted to collect data, and the people responsible do not know what the data are used for. MOT/Jakarta is provided a budget to collect price data, which it provides in turn to local governments, but many local governments are not obliged to use it for price data collection purposes. Data collection frequency is also an issue. Given the sampling method used, BPS does not consider daily data collection useful and is most comfortable providing monthly data. However, because of demand, it does provide weekly data.

The World Bank is focusing on increasing quality control of data entry. Because direct training of regional staff doesn't develop sustainable capacity, they will be implementing a Training of Trainers (TOT) approach this year. They will conduct a TOT for BPS/ Jakarta staff, who will then conduct a TOT for MOT/Jakarta staff. The BPS trainers will then accompany the MOT trainers to the provinces to train local staff.[12]

[12] The World Bank would welcome SEADI collaboration with this capacity strengthening effort.

Both FSA and MOT expressed confidence that the Susenas limitations can be addressed. Special studies have been implemented to address Susenas weaknesses and calculate adjustment factors to adjust for consumption outside the home.

WFP publishes a Monthly Price and Food Security Update that presents data on prices, rainfall, crop production and wages, all derived from secondary data sources and most national-level (except for rainfall maps from BMKG). However, the Update is not in fact available monthly - - March 2012 is the most recent issue, and August 2011 is the most recent issue before that. WFP is working on better incorporating provincial level data into the Update.

National and provincial-level health and nutrition information is collected every three years by the Ministry of Health Riskedas population-based survey. Monthly data on the severe acute malnutrition case load and treatment outcomes are reported by health centers into a Directorate of Nutrition database [http://gizi.depkes.go.id/sig/report.form/]. While severe acute malnutrition is a lagged indicator in terms of early warning, incidence rates are important to monitor in situations where increases in incidence are a recurrent problem, given the risk of death associated with severe acute malnutrition and thus the need for rapid and effective response to increasing incidence.

Best Practice 4: Have analysts with in-depth knowledge analyze the data and present the minimum of information needed, concisely, with narrative and in context. Be clear on the level of confidence in the projections being made.

Collecting, compiling and presenting data in tables and graphs isn't enough. Data needs to be analyzed, interpreted, and placed in context, with appropriate perspective provided. Policy and decision-makers need to understand why specific pieces of data are being presented to them, and why they are important. Knowing who your audiences are, and what are their perspectives and needs is essential to designing information products that will be useful and used. Users should not be overwhelmed with data – the analyst should select the minimum set of data required to explain and substantiate conclusions. Perspective should be provided that helps the user to understand whether the situation and trends observed are usual or represent anomalies. Bonnard and Sheahan describe the following standard market information that should be included in FSMEW reports:

Six steps in early warning analysis:

- *Look for trends*
  - *Historic (over a number of years)*
  - *Seasonal (over one year)*
- *Compare information to reference points/periods (typically when a crisis occurred)*
- *Look for anomalies*
- *Estimate or project future trends (directions, relative magnitudes; qualitatively or quantitatively)*
- *Estimate demand and supply responses (qualitatively or quantitatively)*
- *Form expectations, make plausible assumptions and develop outlooks of what is plausible or expected in the near future (Bonnard & Sheahan, 2009, p. 4)*

> *First, reports should provide regular updates of supply conditions, including estimates of market supplies, stock positions, relevant policies and prices of key commodities and their substitutes. This information should be disaggregated geographically and illustrate conditions for populations typically vulnerable to food insecurity. Second, reports should provide regular updates on demand conditions such as which households have options for*

> *fulfilling their food needs and sufficient coping capacities (responses) and what are the current buying behaviors of industries and other sources of derived demand for food commodities.* (Bonnard & Sheahan, 2009, p. 5)

Exhibit 4 provides three examples of early warning narrative that present data on the current situation and provide context and explanation for observed current and predicted future trends and situations. The depth of the analyst's understanding of the country context is particularly clear in the FEWS NET Somalia example. Figure 8 presents several examples of how to assist the user to put current data in perspective by comparing with prior time period data.

Indonesia's experience

Information is collected and provided at the Menko FSC meetings by several Ministries and institutions. The same or complementary data (e.g. daily and weekly prices, farmgate and retail prices) is collected by different ministries, and they are often different from each other. It is very difficult to obtain consolidated, consistent data (Wayan Susila, personal communication).

For the Menko meeting, each ministry presents data based on a template then the data are discussed. The MOA and MOT data presented are not regularly accompanied by narrative that places the data in context or describes what may be some of the factors determining anomalous behavior.[13] Menko does not appear to develop documentation to inform FSC discussions that consolidates the data from different sources, and analyzes it prior to each meeting.

Both MOT and MOA make data available on external websites, but in both cases, it appears that only statistics are available, either in tables or in searchable databases. The MOA publishes very detailed compilations of descriptive agricultural statistics; however these also do not contain additional analysis or contextualization.

MOT produces three price reports: 1) an internal daily price report with tables and graphs broken down by city and commodity, 2) a weekly report with national averages and city averages and import parity price[14], used internally and also presented at FSC, and 3) a monthly report with aggregated domestic data and coefficients of variability (CV). CV is calculated on daily basis and used to monitor stability over time. Red flags are raised if prices fluctuate above a threshold in any region.

MOT price report narrative basically summarizes what the graphs and tables present; by and large no additional written analysis or explanation is provided although MOT does have specialized commodity-specific analysts with in-depth understanding of the specific commodity who will investigate why increases or anomalies are occurring by calling

[13] However, depending on the issues and as required, they do provide policy drafts and action plans.

[14] BPS used to compare national average with international prices and calculate import parity price, but now the MOT does. However, they are not concerned with the persistent import parity gap (i.e. domestic prices higher than international prices), because it is a direct result of government policies to encourage domestic production (e.g. government procurement/reserve price increasing annually, market stabilization actions).

provincial and district staff and private sector key informants and will include analysis on what happened in area that might have affected price[15]. The provincial government may also

[15] None of the report examples provided by MOT staff to the author contained this kind of analysis, however, so she is unable to further discuss its content or format or assess conformity to best practice.

Exhibit 4

Examples of Early Warning Report Narrative

The forecast for world cereal production has been raised by 48.5 million tonnes since last month, mainly on the expectation of a bumper maize crop in the United States. At the current forecast level, world production would exceed the anticipated utilization in 2012/13 (which has been revised up since last month by 19 million tonnes or 1 percent) and lead to a significant replenishment of world stocks, up 36 million tonnes, or 7 percent, from the previous season.
FAO's latest forecast for world cereal production in 2012 stands at 2 419 million tonnes, a record level, 3.2 percent up from the previous high last year. The bulk of the increase is expected to originate from just one crop in one country - maize in the United States – amid an early start to the planting season, prevailing favourable growing conditions and attractive price prospects. As a result, the global coarse grain production is forecast at 1 248 million tonnes, a huge 85 million tonnes increase from the previous year. However, with planting still to be completed and much of the crop at very early stages of development, the final outcome will depend greatly on weather conditions in the coming months. With the main northern hemisphere rice crops now in the ground in several countries, the forecast of global rice production in 2012 is firmer and points to a 2.2 percent increase, to some 490 million tonnes, mostly reflecting larger plantings in Asia. For wheat, by contrast, latest indications confirm a contraction of global production this year, by about 3 percent to 680 million tonnes, slightly more than earlier anticipated and well above the average of the past five years.
FAO Cereal Supply and Demand Brief 6/7/2012 http://www.fao.org/worldfoodsituation/wfs-home/csdb/en/ accessed 6/26/12

The poor and very poor in the livelihood zones of concern (8, 9, 7, 5) maintain a state of acute food insecurity under Stress (IPC Phase 2). The mobilization of fifty thousand tons of grain between April and June as part of the implementation of the government's operational plan may be insufficient to cover food needs between July and September in the light of rising grain prices.
Unexpected surges in grain prices in most markets across the country between February and March and between March and April are a combination of several factors, including the unusual retention of stocks by a few large producers and wholesalers who expect more significant and better paying institutional purchases, in addition to the increase in domestic demand (the north) and external, with growing demand from wholesalers from Mali.
The continuing influx of 62,000 refugees from Mali, of which 72 percent are located in Area 8 (North transhumant Breeding and millet) is exacerbating food security in this area despite the assistance benefiting refugees. The poor and very poor in this area remain in a Phase 2 (Stress) level of acute food insecurity.
The first rains in the South West of Mouhoun and East during the month of May indicates the beginning of early planting in affected areas.
FEWS NET Burkina Faso Near-term Outlook http://www.fews.net/pages/country.aspx?gb=bf accessed 6/26/12

April to June *Gu* rainfall in most parts of southern Somalia began late and was poorly distributed over both space and time. As a result, the *Gu* season crop harvests in southern agropastoral and inland rainfed cropping areas will likely be delayed and below-average. Agropastoral households also face deteriorating access to humanitarian assistance, high debt burdens, limited livestock holdings, and a still precarious nutrition situation. As a result, the lean season is likely to extend by one month until July and the food security of poor, agropastoral households is likely to deteriorate to Emergency levels (IPC Phase 4) starting in June. A scaling up of humanitarian assistance and activation of the contingency planning process is necessary to address unmet emergency food assistance needs in agropastoral areas over the coming months.
Other factors will also constrain food access in agropastoral zones. First, household-level *Deyr* season grain stocks are likely to have been exhausted as of April. Second, humanitarian access deteriorated from March to June due to new clashes and insecurity. Third, agropastoral households in southern Somalia have very limited livestock holdings. These households typically sell some livestock during the lean season to pay for market purchases of food. However, this year, their herds are small, and only breeding stock are available for sale. Given these constraints poor agropastoral households have relied increasingly on social and kinship support and credit to cover their food needs since May. But from June onwards, access to credit will significantly decline and green maize or sorghum will not be available due to the delay in the Gu harvests, exacerbating existing food deficits. As the lean season extends into July, poor, agropastoral households not receiving humanitarian assistance in Hiran, Bakool, Gedo, and Middle and Lower Juba are therefore expected to face increasing food deficits at the household level. These deficits will occur in the context of already high levels of acute malnutrition.
FEWS NET Somalia Food Security Alert June 18, 2012
http://www.fews.net/docs/Publications/SO_alert_2012_06_final.pdf accessed 6/26/12

Figure 8
Comparing Current Data with Previous Time Periods

Sources: WFP Bangladesh Food Security Monitoring Bulletin Jan-March 2012 http://documents.wfp.org/stellent/groups/public/documents/ena/wfp247911.pdf, WFP Indonesia Monthly Price and Food Security Update March 2012 http://documents.wfp.org/stellent/groups/public/documents/ena/wfp246211.pdf, FEWS NET Zambia Food Security Outlook Update May 2012 http://www.fews.net/docs/Publications/Zambia_FSOU_2012_05_final.pdf, all accessed 6/26/12

call MOT to let them know problem might be occurring. MOT also collects information on what is happening and might happen in near future by monitoring domestic news media and international information (e.g. Reuters.), and can do on-the-spot surveys on an as-needed basis.

The WFP Monthly Price and Food Security Update describes general price trends at the national level and does not present price information for specific vulnerable areas or important markets; the narrative basically repeats the numbers that are provided in the graphs. Rainfall characteristics for the previous month and next month's forecast are presented, but with minimal discussion or analysis of whether the data indicate increased risk for availability of or access to food. The data are presented in color-coded maps showing what appears to be how actual or projected rainfall compares to rainfall in some other period (unfortunately, the legend does not describe what the percentage ranges refer to). In the March 2012 Update, it appears some areas received less rain than normal and some areas are projected to receive significantly less the normal next month, but the implications of this are not discussed. All the crop production data presented are retrospective. Fairly recent information on real wages are presented, usefully disaggregated by agricultural and construction laborers, however, since the data are only presented at the national level and wages and prices vary geographically, they are not as useful as they could be in determining whether risks to access exist in specific areas or population groups within those areas. The 2009 Food Security and Vulnerability Atlas and the geographic distribution of food insecurity and vulnerability is referenced in the Update, but there is no recent data or discussion on food insecurity and current or forecast risks specific to these vulnerable areas. No nutrition-related data are included.

WFP is currently working with FAO to develop a model to improve capacity to predict the impact of shocks on food security. They are currently compiling baseline food security and nutritional status data from Susenas and Riskedas (2007-10), and will then develop he model.

WFP is also in discussions with BPMK and LAPAN on how they could overlay remotely-sensed climate information (rainfall, drought, El Niño) and disaster-prone vulnerable area maps to integrate the information and make forecasts on the effects on e.g. agricultural production.

The MOA is in discussions with FAO to improve national capacity to develop mid-term production outlooks, given Indonesia's important contribution to FAO's global outlook. However, a specific project has not yet been developed. FAO is providing capacity building for modeling, which started last year. Dr. Sudaryanto noted that, 10 years ago when he was research director of the Center for Socio-Economic and Agricultural Policy [(Pusat Analisis Sosial Ekonomi Dan Kebijakan Pertanian (PSEKP)] at the University of Bogor, he and some colleagues developed a model for monthly, 3-monthly and 6-monthly price forecasting, but it was not taken up by any government ministry. He has mentioned the need for such a model to the Minister of Agriculture but has not been able to generate interest in revitalizing it. The MOT has also developed a model to predict price under normal conditions using time series data, but not a structural model that would permit the introduction of shocks to project what might happen.

Best Practice 5: Link early warning to response, link information flows to decision making processes

While it seems self-evident, a FSMEWS that monitors without forecasting, and provides warnings or alerts without being linked to a well-though through plan and range of response options, will not meet its objectives. For example, the IPC reference tables include general and specific response objectives and options for different severities of acute and chronic food insecurity. See Table 4.

Indonesia's experience

Indonesia has a number of response options to react to early warning of potential food insecurity problems. Recommendations on which option to pursue are discussed in the FSC following presentation of data and reports, and the final decision lies with the Coordinating Minister.

Response options include Bulog's safety net; market stabilization, including open market sales and the reserve price and amount of government rice procurements; and disaster relief functions. Bulog has stocks in almost every district, used for the subsidized rice distribution (Raskin) program. They can use them if remote areas have access problems. They can also pre-position extra stocks. The number of Raskin distributions can be increased. In the case of natural disasters, an automatic disaster relief mechanism is triggered whereby each district can immediately access up to 100 tons of rice, and each province can access up to 300 tons.

A 15% retail price increase will trigger Bulog market stabilization actions.

MOT response options include changes in tariff and non-tariff, e.g. fortification requirement for flour, barriers. They can also instruct Bulog to increase rice imports if it appears international or domestic prices are going up. Sometimes, the simple announcement of an increase in the Bulog import quota can be sufficient to prevent local prices from increasing.

Bulog rice imports are conducted government-to-government under MOT Memorandum of Understanding with Thailand, Vietnam, India and Pakistan. The MOU establish an amount of rice to be imported by 2014, but price is not predetermined. Once Bulog gets instructions from the MOT to import rice, it goes to a specific country government and negotiates a price; the negotiation process is not transparent. To increase transparency, the World Bank has proposed that Bulog issue a public tender to the four MOU governments. Bulog is concerned a public tender approach will increase price. In response to this concern, the World Bank proposes to pilot the approach by putting only 10% of rice import requirements out for tender, with a contingency for future purchase at the tendered price, thus using the tender to create a financial instrument to secure predictable pricing. However, a government regulation restricts the budget to be used only for goods and services that are actually delivered, therefore restricting the government's ability to enter into futures contracts..

According to the MOT, meteorological data is mostly discussed in the FSC in terms of implications for production forecast and not to forecast possible problems in distribution/logistics. BPS, however, stated that when waves are forecasted to be above 2 meters, this will engender a response by the Ministry of Transportation in terms of managing traffic and prioritizing ferry space for passenger and food transport vehicles.

Table 4

Integrated Food Security Phase Classification Response Objectives and Options

	Acute Food Insecurity				
	Phase 1: No Acute Food Insecurity	**Phase 2: Stressed**	**Phase 3: Crisis**	**Phase 4: Emergency**	**Phase 5: Catastrophe**
General	Cross-Cutting Objectives: 1) Mitigate immediate outcomes, 2) Support livelihoods, and 3) Address underlying causes				
Response Objectives	• Monitoring	• Disaster Risk Reduction • Preparedness, prevention, and mitigation • Reduce vulnerability and build resilience • Complimentary sectoral support • Close monitoring • Advocacy	• Protect Livelihoods • Livelihood support programs and limited resource transfer to increase food availability, access, and/or utilization • Complimentary sectoral support • Close monitoring • Advocacy	• Save Lives & Livelihoods • Resource transfer and livelihood support programs to increase food availability, access, and/or utilization • Complimentary sectoral support • Close monitoring • Advocacy	• Prevent Total Collapse • Critically urgent protection of human lives • Comprehensive assistance with basic needs (e.g. food, water, shelter, sanitation, health, etc.) • Immediate legal interventions and political-economic negotiations, as necessary • Close monitoring • Advocacy
Chronic Food Insecurity					
General	Objectives should be cross-cutting and holistic, addressing the structural and underlying causes of chronic food insecurity, and should be tailored to the Type of Chronic Food Insecurity (seasonal, on-going, and/or episodic acute crises) and Causes (hazards and vulnerabilities). The higher the Level, the higher the geographic priority and level of investments required. Depending on the situation, more specific objectives can include:				
Response Objectives	• Increase food systems productivity and resilience • Build and protect livelihood assets and strategies • Safety net programs • Disaster risk reduction • Implement micronutrient enhancement programs • Ensure policies and institutional structures are effective • Ensure adequate resources and political will through advocacy				

3. Conclusions and Recommendations

Indonesian institutions collect a wide range of food-security related data. However, the country has a long way to go to convert the data into a functioning FSMEWS, if in fact that is what is needed. Some of the issues that would need to be addressed are structural in nature, and they go well beyond FSMEWS per se, and the purview of this paper. Others have to do with the relative importance of early warning of acute food insecurity as opposed to quality monitoring and in-depth understanding of chronic food insecurity.

Fundamentally, Indonesia does not seem to have established the foundation on which coordinated, integrated, multi-sectoral food security and nutrition strategy, policy and programming should be developed and implemented. There appears to be a clear gap in terms of national and provincial technical food security coordination bodies that could support the design and implementation of food security and nutrition programs, and the generation and interpretation of food security information.

If the level of interest demonstrated by government ministry staff in the author's assignment is a measure of the priority placed on establishing a FSMEWS, it appears to be a low priority. Trying to establish a functioning and effective FSMEWS in the absence of a strong foundation and government-expressed demand would be difficult, and probably of questionable utility, given the chronic nature of food insecurity in Indonesia and the infrequency of acute food insecurity crises.

Nonetheless, there are steps that could be taken to improve the effectiveness of food security information generation, analysis and use. Much can be done to improve the quality of food security-related data and analysis. The key informants were almost unanimous in their opinions, and the author largely agrees, that **better quality data - more timely and more accurate - and more accurate models** are required, rather than more or different data. There are several on-going efforts, described in Section 2 of this paper, to address some of the data quality and modeling concerns.

In addition to these on-going efforts, addition steps that could be considered include:

5. **Add indicators to MOT Market Price Monitoring system**: The MOT could usefully **integrate the price, production and trade tracking, forecasting and analytical data and tools now available through initiatives such as IFPRI's Food Security Portal and FAO GIEWS** into their Market Price Monitoring

system. Close **collaboration with MOA AMIS focal points** as the AMIS initiative moves forward is also important.

6. **Strengthen analytical and report-writing capacity**: Support for better use of existing data should be a priority. Capacity strengthening of ministry analysts in how to **analyze and combine quantitative and qualitative current and historical information**, and **write effective, action-oriented food security briefs** and bulletins could be a useful immediate next step. Capacity-strengthening workshops in this area should be designed to include participants from the range of agencies currently involved in collecting, analyzing and reporting food security-related information, including BPS, Menko, MOA, MOA, MOT and WFP.

7. **Strengthen baseline data and understanding**: The government could strengthen its understanding of why and how people are food insecure in a number of areas, to better monitor factors that can potentially affect the food security situation.

    a. Given the effects of government policies that keep food prices high, continued efforts to **quantify and explain the effect of government trade and price policy on poverty and household food security** would be useful to inform policy.

    b. Indonesia's food marketing system already faces numerous logistic challenges, some due to inadequately developed infrastructure, and other due to natural hazards. A **comprehensive production and commodity market networks analysis** would strengthen the government's ability to understanding and predict which areas and population groups are likely to be affected by different kinds of production, market and natural risks.

    c. Improving understanding the ways in which people access food (sources of food - own production, purchase, safety nets, etc. – and income – crop and livestock sales, labor, trade, etc.) and how these variables vary according to a household's geographic location and wealth will improve the government's capacity to identify and monitor the hazards that can threaten this access. The government should consider conducting a **livelihood profiling exercise** for the other highly vulnerable areas in Indonesia, to complement the livelihood zones already identified in NTT.

8. **Expand software capacity**: The World Bank key informant also recommended that the MOT consider building capacity to use CS Pro [http://www.census.gov/population/international/software/cspro/], which is a US Census Bureau-developed public domain statistical package for entering, editing, tabulating, mapping, and disseminating census and survey data, including to identify anomalies in price patterns at national or regional levels. The package is

widely used by statistical agencies in developing countries. The U.S. government provides free training in using the software.

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1.

Appendix 1. AFSIS Agricultural Commodity Outlook No. 7 December 2011 Table of Contents

MAIN TEXT
1. Highlights of Rice Outlook for 2012
2. ASEAN Rice Situation in 2011
3. Prospects for Rice in 2012
4. Highlights of Maize Outlook for 2012
5. ASEAN Maize Situation in 2011
6. Prospects for Maize in 2012
7. Highlights of Sugar Outlook for 2012
8. ASEAN Sugar Situation in 2011
9. Prospects for Sugar in 2012
10. Highlights of Soybean Outlook for 2012
11. ASEAN Soybean Situation in 2011
12. Prospects for Soybean in 2012
13. Highlights of Cassava Outlook for 2012
14. ASEAN Cassava Situation in 2011
15. Prospects for Cassava in 2012
16. Explanatory notes
17. Milling Rate of Rice
18. Extraction Rate of Sugar

ANNEX
1 Rice crop calendar (harvested months) for crop year 2011/12 (2012)
2 Maize crop calendar (harvested months) for crop year 2011/12 (2012)
3 Sugarcane crop calendar (harvested month) for crop year 2011/12 (2012)
4 Soybean crop calendar (harvested months) for crop year 2011/12 (2012)
5 Cassava crop calendar (harvested months) for crop year 2011/12 (2012)
6 List of Delegates of the 6th Agricultural Commodity Outlook Committee Meeting

List of Tables
1 Summary of the ASEAN rice situation, 2011-2012 (milled rice)
2 Paddy production in ASEAN countries, 2010-2012
3 Paddy planted area in ASEAN countries, 2010-2012
4 Paddy harvested area in ASEAN countries, 2010-2012
5 Paddy yield in ASEAN countries, 2010-2012
6 Paddy damaged area in ASEAN by cause of damage, 2011
7 Rice balance sheet of ASEAN countries, 2011 (milled rice)
8 Rice balance sheet of ASEAN countries, 2012 (milled rice)
9 Ratio of rice production to domestic utilization in ASEAN countries, 2010-2012
10 Ratio of rice beginning stock to domestic utilization in ASEAN countries, 2010-2012
11 FOB Price of rice in selected ASEAN countries
12 CIF Price of rice in selected ASEAN countries
13 Summary of the ASEAN maize situation, 2011-2012
14 Maize production in ASEAN countries, 2010-2012

15 Maize planted area in ASEAN countries, 2010-2012
16 Maize harvested area in ASEAN countries, 2010-2011
17 Maize yield in ASEAN countries, 2010-2012
18 Maize damaged area in ASEAN by cause of damage, 2011
19 Maize balance sheet of ASEAN countries, 2011
20 Maize balance sheet of ASEAN countries, 2012
21 Ratio of maize production to domestic utilization in ASEAN countries, 2010-2012
22 Ratio of maize beginning stock to domestic utilization in ASEAN Countries, 2010-2012
23 FOB Price of maize (Feed grain) in selected ASEAN countries
24 CIF Price of maize (Feed grain) in selected ASEAN countries
25 Summary of the ASEAN sugar situation, 2011-2012
26 Sugarcane production in ASEAN countries, 2010-2012
27 Sugarcane planted area in ASEAN countries, 2010-2012
28 Sugarcane harvested area in ASEAN countries, 2010-2012
29 Sugarcane yield in ASEAN countries, 2010-2012
30 Sugarcane damaged area in ASEAN by cause of damage, 2011
31 Sugar balance sheet of ASEAN countries, 2011
32 Sugar balance sheet of ASEAN countries, 2012
33 Ratio of sugar production to domestic utilization in ASEAN countries, 2010-2012
34 Ratio of sugar beginning stock to domestic utilization in ASEAN countries, 2010-2012
35 FOB Price of sugar in selected ASEAN countries
36 CIF Price of sugar in selected ASEAN countries
37 Summary of the ASEAN soybean situation, 2011-2012
38 Soybean production in ASEAN countries, 2010-2012
39 Soybean planted area in ASEAN countries, 2010-2012
40 Soybean harvested area in ASEAN countries, 2010-2012
41 Soybean yield in ASEAN countries, 2010-2012
42 Soybean damaged area in ASEAN by cause of damage, 2011
43 Soybean balance sheet of ASEAN countries, 2011
44 Soybean balance sheet of ASEAN countries, 2012
45 Ratio of soybean production to domestic utilization in ASEAN countries, 2010-2012
46 Ratio of soybean beginning stock to domestic utilization in ASEAN countries, 2010-2012
47 FOB Price of soybean in selected ASEAN countries
48 CIF Price of soybean in selected ASEAN countries
49 Summary of the ASEAN cassava situation, 2011-2012
50 Cassava production in ASEAN countries, 2010-2012
51 Cassava planted area in ASEAN countries, 2010-2012
52 Cassava harvested area in ASEAN countries, 2010-2012
53 Cassava yield in ASEAN countries, 2010-2012
54 Cassava damaged area in ASEAN by cause of damage, 2011
55 Cassava balance sheet of ASEAN countries, 2011 (Cassava roots fresh)
56 Cassava balance sheet of ASEAN countries, 2012 (Cassava roots fresh)
57 Ratio of cassava production to domestic utilization in ASEAN countries, 2010-2012
58 Ratio of cassava beginning stock to domestic utilization in ASEAN Countries, 2010-2012
59 FOB Price of Cassava in selected ASEAN countries
60 CIF Price of Cassava in selected ASEAN countries

List of Figures

1 Paddy production of selected countries in ASEAN, 2010-2012
2 Paddy planted area of selected countries in ASEAN, 2010-2012
3 Paddy harvested area of selected countries in ASEAN, 2009-2011
4 Paddy yield of countries in ASEAN, 2010-2012
5 Amount of rice export (million tons) of selected countries in ASEAN in 2011-2012
6 Share of rice export (tons) among ASEAN countries, 2011
7 Share of rice export (tons) among ASEAN countries, 2012
8 Amount of rice import (million tons) by selected countries in ASEAN in 2011-2012
9 Share of rice import (tons) among ASEAN countries, 2011
10 Share of rice import (tons) among ASEAN countries, 2012
11 Amount of ending stock of rice in ASEAN countries
12 Ratio of rice production to domestic utilization in ASEAN countries, 2010-2012
13 Ratio of rice beginning stock to domestic utilization in ASEAN countries, 2010-2012
14 FOB price (US$) of milled rice of selected countries in ASEAN in 2009-2011
15 FOB price (US$) of 5% milled rice of selected countries in ASEAN in 2009-2011
16 CIF price (US$) of milled rice of selected countries in ASEAN in 2009-2011

17 Maize production of selected countries in ASEAN, 2010-2012
18 Maize planted area of selected countries in ASEAN, 2010-2012
19 Maize harvested area of selected countries in ASEAN, 2010-2012
20 Maize yield of selected countries in ASEAN, 2010-2012
21 Amount of maize export (million tons) of selected countries in ASEAN in 2011-2012
22 Share of maize export (tons) among ASEAN countries, 2011
23 Share of maize export (tons) among ASEAN countries, 2012
24 Amount of maize import (million tons) by selected countries in ASEAN in 2011-2012
25 Share of maize import (tons) among ASEAN countries, 2011
26 Share of maize import (tons) among ASEAN countries, 2012
27 Amount of ending stock of maize in ASEAN countries
28 Ratio of maize production to domestic utilization in ASEAN countries, 2010-2012
29 Ratio of maize beginning stock to domestic utilization in ASEAN countries (Food security ratio), 2010-2012
30 FOB price (US$) of maize of selected countries in ASEAN in 2009-2011
31 CIF price (US$) of maize of selected countries in ASEAN in 2009-2011
32 Sugarcane production of selected countries in ASEAN, 2010-2012
33 Sugarcane planted area of selected countries in ASEAN, 2010-2012
34 Sugarcane harvested area of selected countries in ASEAN, 2010-2012
35 Sugarcane yield of selected countries in ASEAN, 2010-2012
36 Amount of sugar export (million tons) of selected countries in ASEAN in 2011-2012
37 Share of sugar export (tons) among ASEAN countries, 2011
38 Share of sugar export (tons) among ASEAN countries, 2012
39 Amount of sugar import (million tons) by selected countries in ASEAN in 2011-2012
40 Share of sugar import (tons) among ASEAN countries, 2011
41 Share of sugar import (tons) among ASEAN countries, 2012
42 Amount of ending stock of sugar in ASEAN countries
43 Ratio of sugar production to domestic utilization in ASEAN countries, 2010-2012
44 Ratio of sugar beginning stock to domestic utilization in ASEAN countries, 2010-2012
45 FOB price (US$) of white sugar of selected countries in ASEAN in 2009-2011
46 Soybean production of selected countries in ASEAN, 2010-2012
47 Soybean planted area of selected countries in ASEAN, 2010-2012
48 Soybean harvested area of selected countries in ASEAN, 2010-2012
49 Soybean yield of selected countries in ASEAN, 2010-2012
50 Amount of soybean export (million tons) of selected countries in ASEAN in 2010-2012
51 Share of soybean export (tons) among ASEAN countries, 2011
52 Share of soybean export (tons) among ASEAN countries, 2012
53 Amount of soybean import (million tons) by selected countries in ASEAN in 2011-2012
54 Share of soybean import (tons) among ASEAN countries, 2011
55 Share of soybean import (tons) among ASEAN countries, 2012
56 Amount of ending stock of soybean in ASEAN countries
57 Ratio of soybean production to domestic utilization in ASEAN countries, 2010-2012
58 Ratio of soybean beginning stock to domestic utilization in ASEAN Countries, 2010-2012
59 CIF price (US$) of soybean of selected countries in ASEAN in 2009-2011
60 Cassava production of selected countries in ASEAN, 2010-2012
61 Cassava planted area of selected countries in ASEAN, 2010-2012
62 Cassava harvested area of selected countries in ASEAN, 2010-2012
63 Cassava yield of selected countries in ASEAN, 2010-2012
64 Amount of cassava export (million tons) of selected countries in ASEAN in 2011-2012
65 Share of cassava export (tons) among ASEAN countries, 2011
66 Share of cassava export (tons) among ASEAN countries, 2012
67 Amount of cassava import (million tons) by selected countries in ASEAN in 2011-2012
68 Share of cassava import (tons) among ASEAN countries, 2011
69 Share of cassava import (tons) among ASEAN countries, 2012
70 Amount of ending stock of cassava in ASEAN countries
71 Ratio of cassava production to domestic utilization in ASEAN countries, 2010-2012
72 Ratio of cassava beginning stock to domestic utilization in ASEAN countries, 2010-2012
73 FOB price (US$) of cassava flour of selected countries in ASEAN in 2009-2011
74 FOB price (US$) of cassava pellets of selected countries in ASEAN in 2009-2011
75 FOB price (US$) of cassava shredded of selected countries in ASEAN in 2009-2011

Appendix 2. Integrated Phase Classification Acute Food Insecurity and Chronic Food Insecurity Reference Tables

IPC ACUTE FOOD INSECURITY REFERENCE TABLE

Appendix Table 2.1

IPC Acute Food Insecurity Reference Table for Household Groups

	Phase 1: No Acute Food Insecurity	Phase 2: Stressed	Phase 3: Crisis	Phase 4: Emergency	Phase 5: Catastrophe
Summary Description	Household groups do not experience short term instability; -OR- Household groups experience short term instability but are able to meet basic food needs without atypical coping strategies	Household group experiences short term instability; -AND- Household group food consumption is reduced but minimally adequate without having to engage in irreversible coping strategies	Household group experiences short term instability; -AND- Household group has significant food consumption gaps with high or above usual acute malnutrition; -OR- Household group is marginally able to meet minimum food needs only with irreversible coping strategies such as liquidating livelihood assets or diverting expenses from essential nonfood items	Household group experiences short term instability; -AND- Household group has extreme food consumption gaps resulting in very high acute malnutrition or excess mortality; -OR- Household group has extreme loss of livelihood assets that will likely lead to food consumption gaps	Household group experiences short term instability; -AND- Household group has near complete lack of food and/or other basic needs where starvation, death, and destitution are evident
	Contributing Factors				
Hazards & Vulnerability	None or minimal effects of hazards and vulnerability causing short-term instability	Effects of hazards and vulnerability causing short-term instability and stressing livelihoods and food consumption	Effects of hazards and vulnerability causing short-term instability resulting in loss of assets and/or significant food consumption deficits	Effects of hazards and vulnerability causing short-term instability resulting in large loss of livelihood assets and/ or food consumption deficits	Effects of hazards and vulnerability causing short-term instability resulting in near complete collapse of livelihood assets and/or massive food consumption deficits
Food Availability, Access, Utilization, Stability	NDC	Stressed, borderline adequate, and short-term unstable	Inadequate and short-term unstable	Extremely inadequate and short-term unstable	Effectively no availability, access, and utilization; volatile
Human Water Requirement from Improved Source	NDC	Water: >= 15 liters pppd, unstable	Water: 7.5 to 15 liters pppd; unstable	Water: 4 to 7.5 liters pppd, unstable	Water: < 4 liters pppd, unstable

	Phase 1: No Acute Food Insecurity	Phase 2: Stressed	Phase 3: Crisis	Phase 4: Emergency	Phase 5: Catastrophe
	Household Outcomes				
Food Consumption (Quantity & Quality)	NDC	Quantity: Minimally adequate (2,100kcal pp/day) & unstable Quality: Minimally adequate micro-nutrients & unstable HDDS: Reduced and unstable dietary diversity but meeting most nutrient needs FCS: Acceptable consumption HHS: None or slight (scores 0-1) CSI: = Reference, but unstable HEA: Small or moderate Livelihood Protection Deficit	Quantity: Significant gap -OR- 2,100 kcal pp/day via asset stripping Quality: Significant lack of micro-nutrients -OR- adequate micronutrients pp/day via asset stripping HDDS: Acute dietary diversity deficit limiting key micronutrients FCS: Borderline consumption HHS: Moderate (scores 2-3) CSI: > Reference and increasing HEA: Substantial Livelihood Protection Deficit -OR- Small Survival Deficit <20%	Quantity: Extreme gap; much below 2,100kcal pp/day Quality: Extreme lack of micro-nutrients HDDS: Acute dietary diversity deficit limiting key micronutrients and macronutrients FCS: Poor consumption HHS: Severe (scores 4-6) CSI: Significantly> reference HEA: Survival Deficit	Quantity & Quantity: Effectively complete gap HDDS: Extreme dietary deficit of both micro and macronutrients FCS: [Below] poor consumption HHS: Severe (6) CSI: Far> reference HEA: Survival Deficit>20%
Livelihood Change (Assets & Strategies)	NDC	Livelihood: Stressed Coping Strategies: 'Insurance Strategies'	Livelihood: Accelerated depletion Coping Strategies: 'Crisis Strategies'	Livelihood: Irreversible depletion Coping Strategies: 'Distress Strategies'	Livelihood: Near complete collapse Coping Strategies: Effectively no ability to cope
Nutrition (Due to Food Deficits)	NDC	Presence of mildly acutely malnourished child and/or mother	Presence of moderately acutely malnourished child and/or mother	Presence of severely acutely malnourished child and/or mother	Presence of several severely acutely malnourished children and/or adolescents/adults
Mortality	NDC	Unchanged	Marginal increase; unstable	Significant increase	Death is evident in most households
	Area Contextual Outcomes				
Nutrition (Due to Food Deficits)	NDC	Wasting Rate: 3-10%, unstable BMI < 18.5 Rates: 10-20%, unstable	Wasting Rate: 10-15% -OR- > usual & increasing; or oedema BMI < 18.5 Rates: 20-40%, 1.5 x greater than reference	Wasting Rate: 15-30% -OR- > usual & increasing; oedema BMI < 18.5 Rates: > 40%	Wasting Rate: > 30% -AND/OR- oedema BMI < 18.5 Rates: far> 40%
Death Rate	NDC	CDR: < 0.5/10,000/day, unstable U5DR: <= 1/10,000/day, unstable	CDR: 0.5-1/10,000/day, unstable U5DR: 1-2/10,000/day, unstable	CDR: 1-2/10,000/day -OR- > 2x reference U5DR: 2-4/10,000/day	CDR: > 2/10,000/day U5DR: > 4/10,000/day

	Phase 1: No Acute Food Insecurity	Phase 2: Stressed	Phase 3: Crisis	Phase 4: Emergency	Phase 5: Catastrophe
	General Action Framework				
Cross-Cutting Objectives: 1) Mitigate immediate outcomes, 2) Support livelihoods, and 3) Address underlying causes	Monitoring	Disaster Risk Reduction Preparedness, prevention, and mitigation Reduce vulnerability and build resilience Complimentary sectoral support Close monitoring Advocacy	Protect Livelihoods Livelihood support programmes and limited resource transfer to increase food availability, access, and/or utilization Complimentary sectoral support Close monitoring Advocacy	Save Lives & Livelihoods Resource transfer and livelihood support programmes to increase food availability, access, and/or utilization Complimentary sectoral support Close monitoring Advocacy	Prevent Total Collapse Critically urgent protection of human lives Comprehensive assistance with basic needs (e.g. food, water, shelter, sanitation, health, etc.) Immediate legal interventions and political-economic negotiations, as necessary Close monitoring Advocacy

Note: *BMI = body mass index; CDR = crude death rate; CSI = coping strategies index (developed by CARE and the WFP); FCS = food consumption scale; HDDS=household dietary diversity score; HEA = household economy analysis; HH = household; HHS = household hunger scale; NDC = not a defining characteristic; pppd = per person per day; U5DR = under five crude death rate*

Source: FEWS NET http://www.fews.net/ml/en/info/pages/scale.aspx *accessed 6/24/12*

IPC CHRONIC FOOD INSECURITY REFERENCE TABLE (PROTOTYPE, UNDERGOING FIELD TESTING)

Appendix Table 2.2

IPC Chronic Food Insecurity Reference Table for Household Groups

		Level 1: Low Chronic Food Insecurity	Level 2: Moderate Chronic Food Insecurity	Level 3: High Chronic Food Insecurity	Level 4: Very High Chronic Food Insecurity
Level Description		Considering recent normal years, less than 10% of the HHs do not have adequate quantity and quality of food throughout the year; **AND** · The area has not had recurrent Acute Food Security Phase 4 or 5 (or equivalent) in the past 10 years.	Considering recent normal years, 10 to 20% of the HHs do not have adequate quantity and quality of food throughout the year; **OR** · The area has had occasional Acute Food Security Phase 4 or 5 (or equivalent) in the past 10 years.	Considering recent normal years, 20 to 40% of the HHs do not have adequate quantity and quality of food throughout the year; **OR** · The area has had frequent Acute Food Security Phase 4 or 5 (or equivalent) in the past 10 years.	Considering normal years, more than 40% of the HHs do not have adequate quantity and quality of food throughout the year; **OR** · The area has had very frequent Acute Food Security Phase 4 or 5 (or equivalent) in past 10 years
Outcomes	**Food Consump-tion**	**Quantity:** Lack of 2,100 kcal average pp/day: <10% hhs ***FCS****: poor/borderline: <10% hhs* ***HHS:*** *moderate/severe (scores 2-6): <10%* ***HDDS****: <4 food group (out of 12 food groups)s: <10%* ***HEA****: <Livelihood Protection Deficit: <10%*	**Quantity:** Lack of 2,100 kcal average pp/day: 10-20% hhs ***FCS****: poor/borderline: 10-20% hhs* ***HHS:*** *moderate/severe (scores 2-6): 10-20%* ***HDDS****: <4 food group (out of 12 food groups): 10- 20%* ***HEA****: <Livelihood Protection Deficit: 10-20%*	**Quantity:** Lack of 2,100 kcal average pp/day: 20-40% hhs ***FCS****: poor/borderline: 20-40% hhs* ***HHS:*** *moderate/severe (scores 2-6): 20-40%* ***HDDS****: <4 food group (out of 12 food groups): 20- 40%* ***HEA****: <Livelihood Protection Deficit: 20-40%*	**Quantity:** Lack of 2,100 kcal average pp/day: >40% hhs ***FCS****: poor/borderline:>40% hhs* ***HHS:*** *moderate/severe (scores 2-6): >40%* ***HDDS****: <4 food group (out of 12 food groups): >40%* ***HEA****: <Livelihood Protection Deficit: >40%*
	Livelihood Change	Gradual year-to-year erosion of Livelihood Assets (5 capitals) and Strategies: <10% HHs	Gradual year-to-year erosion of assets and strategies: 10 to 20% HHs	Gradual year-to-year erosion of assets and strategies: 20 to 40% HHs	Gradual year-to-year erosion of assets and strategies: >40% HHs
	Nutrition	**Stunting**: <20% ***Anemia*** *: <5%* ***Vitamin A deficiency****: <2%*	**Stunting**: 20 – 30% ***Anemia*** *: 5– 20%* ***Vitamin A deficiency****: 2% - 10%*	**Stunting**: 30 – 40% ***Anemia*** *: 20 – 40%* ***Vitamin A deficiency****: 10 - 20%*	**Stunting**: >40% ***Anemia*** *: >40%* ***Vitamin A deficiency****: > 20%*
	Recurrence of Acute Emergencies	None or 1 year over the past 10 years of Acute Phase 4 or 5 for the admin area.	2 years over the last 10 years of Acute Phase 4 or 5 for the admin area.	3-4 years over the last 10 years of Acute Phase 4 or 5 for the admin area.	5-10 years over the last 10 years of Acute Phase 4 or 5 for the admin area.

		Level 1: Low Chronic Food Insecurity	Level 2: Moderate Chronic Food Insecurity	Level 3: High Chronic Food Insecurity	Level 4: Very High Chronic Food Insecurity
Contributing Factors	**Hazards & Vulnerability**	**Hazards:** Rare events in admin area **Assets:** Insufficient 5 capitals: <10% HHs. **Below Nat'l Poverty Line**: <10% **Strategies**: Unsustainable: <10% HHs **Policies, Institutions, and Processes (PIPs)**: Adequate to high performance for admin area	**Hazards:** Occasional events in admin area **Assets:** Insufficient 5 capitals: 10-20% HHs **Below Nat'l Poverty Line**: 10-20% **Strategies**: unsustainable: 10-20% HHs **PIPs**: Medium performance for admin area	**Hazards:** Frequent events in admin area **Assets:** Insufficient 5 capitals: 20-40% HHs **Below Nat'l Poverty Line**: 20-40% **Strategies**: unsustainable: 20-40% HHs **PIPs**: Poor performance for admin area	**Hazards:** Very frequent events in admin area **Assets:** Insufficient 5 capitals >40% HHs **Below Nat'l Poverty Line**: >40% **Strategies**: unsustainable: >40% hhs **PIPs**: Very poor performance for admin area
	Availability, Access, Utilization, Stability	Inadequate availability, access, utilization of food and/or there is inter-annual instability: <10% HHs	Inadequate availability, access, utilization of food and/or there is inter-annual instability: 10 to 20% HHs	Inadequate availability, access, utilization of food and/or there is inter-annual instability: 20 to 40% HHs	Inadequate availability, access, utilization of food and/or there is inter-annual instability: >40% HHs
	Water (improved sources)	No Access to improved sources: <10% HHs	No Access to improved sources: 10-20% HHs	No Access to improved sources : 20-40% HHs	No Access to improved sources: >40% HHs
General		Objectives should be cross-cutting and holistic, addressing the structural and underlying causes of chronic food insecurity, and should be tailored to the Type of Chronic Food Insecurity (seasonal, on-going, and/or episodic acute crises) and Causes (hazards and vulnerabilities). The higher the Level, the higher the geographic priority and level of investments required. Depending on the situation, more specific objectives can include:			
Response Objectives		□ Increase food systems productivity and resilience □ Build and protect livelihood assets and strategies □ Safety net programmes □ Disaster risk reduction □ Implement micronutrient enhancement programmes □ Ensure policies and institutional structures are effective □ Ensure adequate resources and political will through advocacy			

Appendix 3. Key Informants

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4. Rita, Estate Crops Statistics, rita@bps.go.id, 62-21-384-1195 ext 5130 (o)

Ministry of Agriculture

5. Prof. Tahlim Sudaryanto, P.D., Assistant Minister for International Cooperation, tahlim@deptan.go.id, 62-21-780-4327 (o), 62-81-111-7633 (m)
6. Dr. Ir. Hermanto, MS. Secretary, Agency for Food Security, hermanto@deptan.go.id, 62-21-780-4476 (o)
7. Muhammad Tassim Billah, Director, Center for Agricultural Data and Information Systems, tassim@deplan.go.id, 62-21-781-6384 (o), 62-812-969-4647 (m)
8. Ir. Sabarella, M.Si, Head, Sub Division Socioeconomic Livestock Data, Center for Agricultural Data and Information Systems, sabarella@deptan.go.id, 62-21- 780-5305 (o)
9. Pak Putu, Center for Agricultural Data and Information Systems.

Ministry of Trade

10. Ibu Tjahya Widayanti, Director, Center for Domestic Trade Policy, tjahya11@yahoo.com, 62-21-23-528-682 (o), 62-81-594-5055 (m)
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World Bank

12. Kiyoshi Taniguchi, Economist, ktaniguchi1@worldbank.org, 62-21-5299-3258 (o), 62-82-11-300-6785 (m)

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13. Michi Yamanakajima, M&E and Reporting Officer, michi.yamanakajima@wfp.org, 62-21-570-9004 ext 2437 (o)